

A Database Publication

electron

Vol. 6 No. 6 March 1989 £1.25

user

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Last Ninja,
Zenon

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BONECRUNCHER

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GHOULS

GHOULS

Microcaber's Ghoul is a game that plays the part of a hero who must on a path to a goal with various power-ups and lightning release. This series of addictive games with Super's Microcaber and Super's Ghoul are the best ever to the Electron.

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Superior Software has combined three classic hits from other software houses (one new to the Electron) with one of its own top hits. The result is a top quality four-game compilation that combines variety with great value for money.

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Write your own arcade smashes using the

ARCADE GAME Creator

Arcade Game Creator is a suite of programs for the Electron and BBC Micros. Taken from the pages of *Electron User*, it lets you into the secrets of writing fast-action arcade games, and provides you with a number of utilities to make design and programming easier.

Among the programs are:

- A Mode 5 sprite editor that lets you design your own multi-coloured characters.
- A selection of fast print routines that will move sprites both in front or behind other objects on the screen.
- Map generators that will squeeze a Mode 5 screen into 8 bytes!
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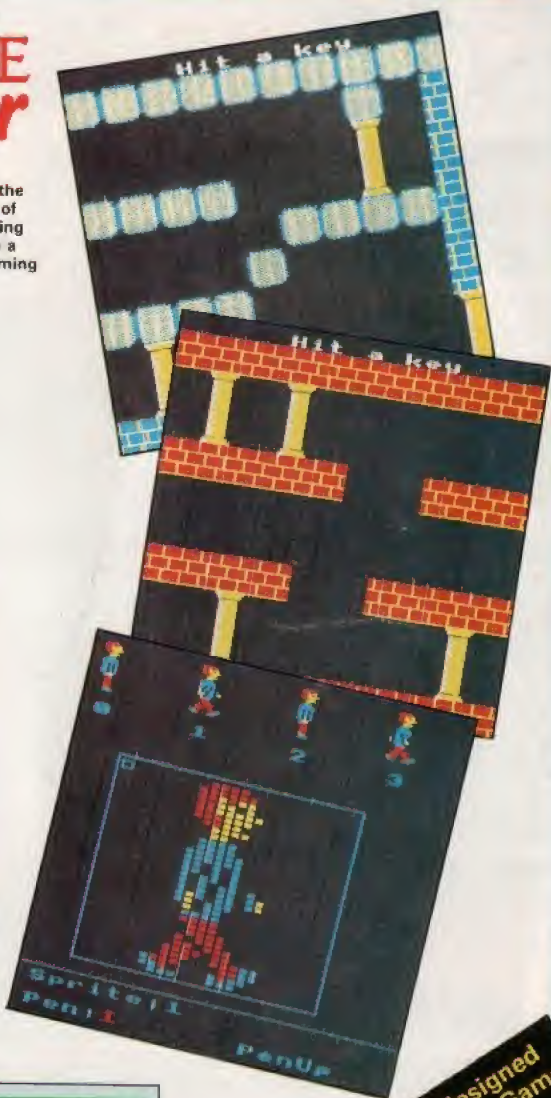
To help you make the most of the Arcade Game Creator, you will also get a comprehensive manual based on the original series.

Written in an easy to read style and with many illustrations and screen shots, it contains all the information you need to create and animate sprites, to design backgrounds and to link the two together into a complete arcade game.

If you are an aspiring games programmer, this is an offer you simply cannot afford to miss!

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electron user NEWS



Firetrack speeds in for the Electron

LATEST compilation from Superior (0532 459453), *Play It Again Sam 7* includes an Electron conversion of Electric Dreams' *Firetrack*.

"Because of the graphics and the speed, a lot of people thought it was impossible to produce *Firetrack* for the Electron", said Superior's Steve Hanson.

"We are very pleased with the Electron version. It has the multi-coloured background and is very fast. There are some differences of choice in the way the game is played and no music, but we don't think this will affect players' enjoyment".

Firetrack, one of the top BBC Micro games of 1987, is teamed with *Bone Cruncher*, *Snapper* and *Ghouls* in *Play It Again Sam 7*, price £9.95.

Planned for release late March or early April is *Play It Again Sam 8*. This includes *Winter Olympiad '88* - the first time Superior has included a Tynesoft game in its compilations.

Steve Hanson has welcomed the Tynesoft connection, which he sees as a good way to keep up interest in the Electron. Colin Courtney of Tynesoft (091-414 4611) said there could be a possibility of further cooperation in the future, but at present he sees the *Olympiad* deal as a one-off.

Play It Again Sam 8 will also include *Quest*, *Around the World in 40 Screens* and *Mr. Wiz*. Price: £9.95.

Electron graphics get the message across

BUSINESSMAN Peter Woolsey built his television advertising company by using Electron-generated graphics. He believes the best place to hit people with advertising is when they are collecting their cash and hopes to have his Media 2000 service on show in 1,000 sub post offices by the end of the year. When he started his business, he needed graphics to get his clients' advertising messages on screen to be watched by post office queues and he chose the Electron for the job.

CHEATING has paid off for 77 *Electron User* readers who were successful in our November competition.

First out of the sack with the correct answers on four world famous cheats was Peter Goodson of Stansted. He wins any five games of his choice for his Electron, plus two volumes of *Cheat It Again Joe* to help him past those tricky bits.

Second place goes to A. Young of Paisley who will soon be receiving any three games plus the useful cheats from Impact.

To get new interest out of old games, 75 other winners will receive both volumes of *Cheat It Again Joe*.

Correct answers were: 1, Maradona; 2, Lester Piggott; 3, Guinness; 4, John McEnroe.

He is also installing his screens in public houses where viewers are susceptible to advertising and has plans to put large multi-screen units into shopping centres incorporating new double sided television displays.

With smaller displays, information is distributed at regular intervals on disc. Programs with more than 15 advertisements are sent via modems and ITV Oracle.

"When we install a system we do not charge anything", he said. "Our retailers get a percentage of the income from the advertisers and they end up with their



A Media 2000 multi screen panel

own local television station.

"It is far more effective to advertise when people are collecting their cash than on TV in their homes when they may have another 10 hours, including sleep, before they are able to buy".

"I have been extremely pleased with the graphics we have produced on our Electrons. Although I am currently looking into using other computers, I intend to have my Electrons running until the year 2000".

The Bronte break

WHAT is the connection between Ilkley Moor, the Bronte country and the Acorn Electron? The answer is an interesting summer break for Electron users.

Bradford & Ilkley Community College is offering two summer courses in creative computing, combining a series of lectures with the chance to visit Yorkshire beauty spots and tourist attractions.

Course tutor Colin Sutton who is a full time lecturer at the college, says: "These are not just boring computer courses but something different with the emphasis on being creative and imaginative with a computer.

"They are ideal for beginners or those with a little knowledge, particularly of the Electron, BBC Micro, Master 128 and Compact computers".

The week-long courses include three full days and three half days of tuition with excursions to tourist attractions organised on the free half days.

They run from July 8 to 15 and from July 15 to 22. Accommodation is on campus and the courses cost £185.52.

Full details can be obtained from The Course Director, Bradford Summer School, Bradford & Ilkley Community College, Great Horton Road, Bradford, West Yorkshire BD7 1AY.

Aid for the autistic

THE National Autistic Society will benefit at the tune of £50,000 if firms in the computer games industry hit their 1989 charity target.

Its annual appeal was launched at the industry dinner in London with £15,000 being pledged on the night. Organisers have been encouraged by this flying start and are now calling for titles to be included in a charity games compilation.

There are also plans for a Day of Action on May 4 when companies will be asked to undertake fund-raising efforts.

Gallup Software Chart



THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	1	FRANKENSTEIN 2000 <i>Atlantis</i>	Still topping the chart is this mixture of Inner Space, Fantastic Voyage and things that go bump in the night. Well worth the money.	1.99
2	4	INDOOR SOCCER <i>Atlantis</i>	If you have tired of the outdoor variety it is probably time to go for the indoor version. Not the best football implementation though.	1.99
3	3	JOE BLADE 2 <i>Players</i>	The graphics are excellent and the game very playable. The puzzle screens are difficult, but this is a superb sequel and will keep you busy for hours.	1.99
4	•	SMASH & GRAB <i>Blue Ribbon</i>	Back in the Top 10 is this budget title. Give this one a go if you are feeling especially villainous. Nothing new is involved, but it's very playable.	1.99
5	10	VIDEO CLASSICS <i>Firebird</i>	A budget collection of some simple and fun games. This title will keep reappearing in the charts. Definitely cheap and cheerful.	1.99
6	2	COMMANDO <i>Encore</i>	Excellent value and one you should certainly add to your collection if you have not already done so. This shoot-'em-all is what you would expect.	2.99
7	•	LAST NINJA <i>Superior</i>	Highest new entry this month - you can read the review in this issue. An excellent game if you can ignore the historical inaccuracies.	9.95
8	•	EXILE <i>Superior</i>	Returning to the charts this month is this mammoth game. There is a massive cave system to work through and it will keep you busy for days.	12.95
9	•	STRYKER'S RUN <i>Blue Ribbon</i>	One of the old Superior games now released with CDS under the Blue Ribbon label. If you don't have the original you must buy this one.	2.99
10	•	CITADEL <i>Blue Ribbon</i>	The second of these re-releases and yet another classic of its type. If you are new to the Electron buy it, you won't be disappointed.	2.99
11	•	REPTON <i>Blue Ribbon</i>	The original little green monster. He has popped on to the screen in various guises and in different settings since, but this is the original.	2.99
12	7	PERCY PENGUIN <i>Blue Ribbon</i>	Not quite in the same league as the other Blue Ribbon/Superior releases, but fun, nice looking and very enjoyable to play.	1.99
13	15	MR WIZ <i>Blue Ribbon</i>	Mr Wiz is lost again and needs you to lead him around his garden collecting cherries while avoiding the dangers.	1.99
14	•	CHUCKIE EGG <i>A & F</i>	Enter the chicken house and join this ladders and levels game. Fall and you'll be scrambled. Avoid disaster and collect all the riches you could want.	9.95
15	•	RICK THE ROADIE <i>Alternative</i>	This may be the closest you ever come to fame and fortune. Your job is to get your group to the gig. If you succeed they will play you a tune. Different.	1.99
16	•	CREEPY CAVE <i>Atlantis</i>	Yes you've done it again - lost your key. But this time it has been found by a ghost which entices you into the caves to retrieve it.	1.99
17	20	OLYMPIC SPECTACULAR <i>Alternative</i>	Gone for another four years, but if you can't wait that long have a go at this version. Pushing on now, but still good value.	1.99
18	•	CRICKET <i>BugByte</i>	Try this if sport is in your blood. Not the most exciting, colourful or stimulating game - but if you are addicted you might like it.	2.99
19	•	COPS 'N' ROBBERS <i>Atlantis</i>	You may consider this of dubious taste, but you must outwit the cumbersome coppers anyway you can to make off with the loot.	1.99
20	•	STAR FIGHT <i>Alternative</i>	Back in the charts is this one from the prolific Alternative. As usual no argument on value for money. Simple and easy to play.	1.99

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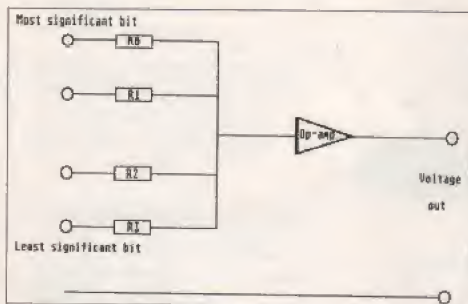


Figure I: A very simple digital to analogue converter circuit

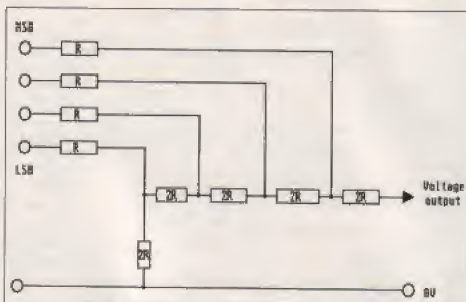


Figure II: An R-2R digital to analogue converter circuit

We completed the construction of our input/output expansion board, in the January 1989 issue of *Electron User*. Now let's look at some of its uses. We're already aware of the task performed by analogue to digital converters – they convert an analogue signal, such as the voltage from a light sensing circuit, into a digital form that can be processed by the Electron. The Plus 1's ADC is a typical example.

However, it is occasionally useful to be able to convert digital information stored in the computer into a varying voltage that can be used to control some external electrical equipment, such as a light bulb or a motor.

The emphasis is on varying, as in the past when we've controlled other items of equipment from the Electron the output voltage has been either 0V or 5V, with nothing in between. This is digital control. Now we'll look at a method of achieving analogue control of equipment in which the voltage changes smoothly from one extreme to the other.

The basis of any system for carrying out digital to analogue conversions is a network

Using his input/output board, Joe Pritchard shows how to convert the Electron's digital signals into analogue

of resistors feeding an operational amplifier circuit, such as that shown in Figure I. Digital signals are applied to the inputs, and if the resistors are all the same value the output voltage will depend upon the number of digital one inputs. The more of these there are, the higher the output voltage.

Clearly, the number of different output voltage levels obtained would be the same as the number of digital inputs. A more useful means of getting digital to analogue conversion is to make the value of each resistor different.

In this setup R1 could be twice R0, R2 could be twice R1, and so on. This is a weighted network of resistors, and here the output

voltage depends upon which digital inputs are at one. So the input to R1 has twice the influence on the output voltage as the input to R0. This is, of course, a simple binary system, and if we were to have eight inputs we could have an output voltage with 255 different output levels.

There are problems with using this sort of weighted network, primarily due to the problems of manufacturing resistances that are exactly twice the value of each other. A further resistance network, called the R-2R network, is used in practical digital to analogue converter (DAC) chips. An R-2R circuit is shown in Figure II.

The output voltage produced by this with standard 5V digital inputs will be in the range 0V to 5V. For an eight input DAC – often called an 8 bit DAC – there would be 255 steps between 0V and 5V. However, these steps are fairly small in size, about 20mV per step (5/255).

Changing the least significant bit (LSB) input of a DAC will cause the output to decrease or increase by this step size – called the resolution.

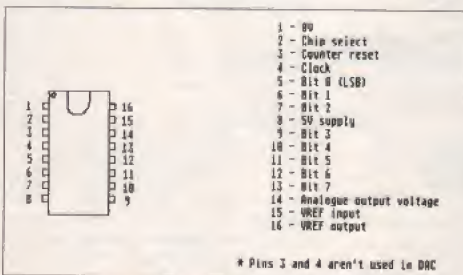


Figure III: The pin-out of the Ferranti ZN425E DAC/ADC chip

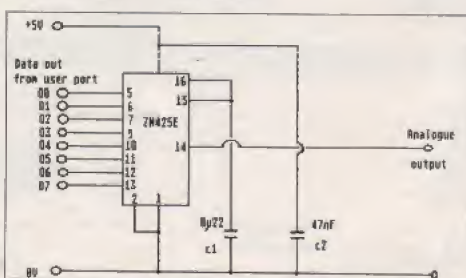


Figure IV: A simple circuit incorporating the ZN425E DAC

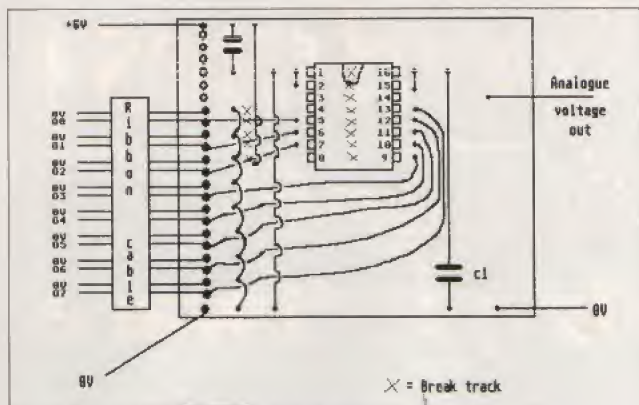


Figure V: One possible use of the digital to analogue converter

In real DAC chips, such as the ZN425E that we'll be using in our circuit, the digital inputs do not feed directly into a resistor, instead they control the action of electronic switches within the chip. These connect the resistor network inputs to either 0V for a zero input, or a separate voltage source called the reference voltage for a one input.

Increasing output

The output from such a DAC will thus be between zero and the reference voltage, which you can usually select. The output from a DAC can be increased using operational amplifiers to give a larger swing of output voltage where necessary, although this will also amplify the step size.

The DAC we will use is the Ferranti ZN425E DAC/ADC. With a few additional components it can also serve as an ADC, but using the chip as a DAC is simplicity itself. The pin-out is shown in Figure III, and the simplest circuit

that allows the device to be used as a DAC is shown in Figure IV. Figure V shows a possible veroboard layout you could use when building the device.

As to the circuit itself, I decided to use the on-board reference voltage of 2.5V, as this saves us having to produce our own. The problem with a reference voltage is that it should be constant over longish periods of time, because if it varies the DAC output will vary even if the digital input signals remain the same.

The capacitor connected to pin 15 is to prevent glitches from giving momentary spurious output voltages. The maximum reference voltage the chip can take on pin 15 is 3V, so don't try using the 5V supply from the user port as a reference voltage.

The capacitor between 5V and 0V is just to decouple the supply, and we take the chip select line of the DAC - pin two - to 0V to permanently enable the output so it constantly reflects the digital input signals it receives from the user port.

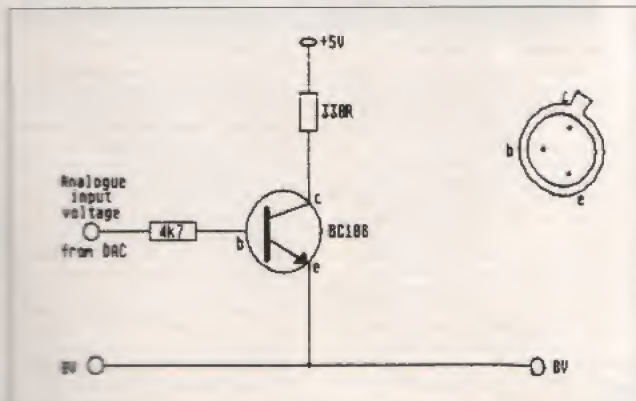


Figure III: Testing the digital to analogue converter

Building the circuit

There's nothing complicated about building the circuit. I used a socket for the chip to protect it from damage while soldering. In addition, with the more complex chips like this one it's not a good idea to handle it too much, as it's just possible that static electricity could damage the internals.

Solder the capacitors as closely to the socket pins as possible, and don't forget to break the tracks on the veroboard between the pins on the socket.

You may wonder why I've connected the wires on the ribbon cable between those carrying signals from the user port to ground. It prevents a phenomenon called crosstalk in which a wire carrying a zero signal adjacent to a wire carrying a one can have a momentary signal induced in it which can cause it to act as if it, too, was carrying a one.

This would lead to random fluctuations in output voltage whenever the input signals changed their values. Not very desirable. Separating the signal inputs from each other by ground connections minimises this effect.

You will need either a voltmeter capable of reading 0V to 5V or a simple circuit such as that shown in Figure VI to test the circuit. With the power disconnected, plug in the ZN425 chip, taking care not to bend pins and to get the chip in the socket the right way up.

Now plug the ribbon cable into the user port and turn the Electron on. If the usual sign on message doesn't appear, turn off immediately and re-check the DAC circuit, especially around the input lines for short circuits.

Now connect up the circuit in Figure IV and use a program such as the following to write bytes to the user port:

```
1000 FOR I=0 TO 255
1010 ?port_address=I
1020 TIME=0
1030 REPEAT UNTIL TIME=50
1040 NEXT
1050 FOR I=255 TO 0 STEP -1
1060 ?port_address=I
1070 TIME=0
1080 REPEAT UNTIL TIME=50
1090 NEXT
1100 GOTO 1000
```

If the port is VIA-based don't forget to set up the data direction register before running this program. You should see the voltage on the meter gradually increase and decrease or the brightness of the LED change as the program runs. If not, check the connections of the DAC to the reference voltage and output pin.

● You should now have a working DAC. Next month we'll examine the use of the DAC to generate sounds, and how it can be the basis of a sound effects circuit.

Adventures

By Pendragon

Blooming software

THE snow has melted and the first mad hares are playing in the field. I sit here feeding my pet falcon Epico, while poring over the dozens of scrolls which have arrived at the castle since I last held forth to you.

A new adventure software house has emerged for the Electron, trading under the bubbling name of Sodasoft. It is set to release a series of 120 location games centred on the adventures of bounty hunter Jim Band.

Each will be released on tape, back to back with a 64k version of the same game. With the ever increasing 64k Electron user base this seems to me to be an idea that other software houses should have thought of eons ago.

The adventures are designed as spoofs on the James Bond/Rick Hanson genre of spy stories. I look forward to receiving its first offering for review within the next couple of weeks.

Another impending release is a Tolkienesque adventure called *The Seekers* from Andrew Harkness - remember I was very impressed by his entry to our home-penned adventure competition in 1987.

His new game includes a novel spellbinding facility which owes something to Level 9's superb *The Price of Magic*. Once again I look forward to reviewing the adventure in the very near future.

Tricia Revest writes to ask for advice on beginning to write her own adventure. Judging by her letter, she already possesses a lovely writing style which is half the battle.

Like many, she can only devote her spare time in the evenings, and wishes particularly to know which is the best adventure creation tool available for the Electron.

You have basically a choice of four: Incentive's Adventure Creator, Alpine's rom-based ALPS, Phoenix Software's Adventureescape and Gilsoft's *The Quill*. While ALPS is an excellent utility, its rom dependence means you will need a Plus 1 or Rombox fitted to your Electron in order to use it.

All of Heyley's 250 location games are written using a modification of Adventureescape, perhaps proving the power of this generator. However, it is rather a complex program and may cause unnecessary confusion to novices.

Adventure Creator was used by Incentive to create *The Ket Trilogy* and *Winter Wonderland*,

but as a tool is perhaps more ideally suited in its BBC Micro format for graphic adventures.

That leaves *The Quill*, which has been used successfully by Geoff Larsen, Anthony Lee, Larry Horstfield and others.

It is by far the most popular of the adventure generators for the Electron and is also my first choice. It can now be picked up from some mail order companies for as little as £12.95, so it also represents a real bargain.

I would be delighted at anytime to receive

readers' home-penned adventures for review or evaluation. So if you think your creation is worthy of publication, grab a carrier pigeon and send it this way.

This month's map is of the opening scenario in Larsoft's *The Nine Dancers*, which I hope will help many frustrated adventurers. Next month I continue this series of maps with a guide to the openings to part one of *The Ket Trilogy*.

● *That's it for this month, so until puppet strings need variables, happy adventuring.*



Knights of the Round Table



This section is dedicated to experienced adventurers who offer their help and expertise to intrepid travellers who are stuck at various points in different adventures. Don't forget that if you write to one of my knights for help, please enclose a stamped self-addressed envelope.

Kneel and arise: Dame Emma Rutherford of 141 Bargates, Leominster, Herefordshire, who can offer help with *Voodoo Castle*, *Sphinx Adventure*, *Kingdom of Hamil*, *Staff of Law*, *Myorem*, *Hampstead*, *Terrormolinos*, *Woodbury End*, *Enthar Seven*, *Quest for the Holy Grail* and *Lords of the Vault*.

Readers' Hall of Fame

Dodgy Geezers - Bill Zanzinger

Go West and cut the fence. South to the Dobermans, drop the sleeping pills and wait for the dogs to fall asleep. Go North West and examine the hut. Lift the carpet, lift the cover, go Down and light the match.

Go Down, West and get the lamp. Light it, then journey Down, Down, West, North, East. At inspection point 7-4-6, go Up, Up, East and North. Soapy digs a hole, so wait and push the grating until it opens. Now go Up and North to Justin Perrier's office. Examine it. Travel South, Down, South, West, Down, Down, West and West to inspection point 6-7-4. Go Up, open the grating, then Up, East, North, Up, Up, East and East to the skylight.

Open the skylight, get the diary, read it, replace it and close the skylight. Now go West, West, Down, Down, South, West and

Down, and close the grating.

Carry on Down, East, East, Up, Up, East and North, get the pickaxe, go Up and close the grating. Journey North and West, get the trolley, then go East and South to the vault door.

Examine the vault and hang about until Mr Video asks you if you want him to take care of the vault door, Reply YES and enter the vault. Examine the crates, open them and don't forget to close them afterwards.

When asked if you should load up now, reply NO. Collect the nails, get the trolley, go North and close the vault. Now go North and West and drop the trolley.

Follow on East, South, East, East, East and get in the van. When Tricks asks "Where to?" reply DOCKS. Eventually you arrive at the jetty. Now get out of the van, board the yacht, get the newspaper and finish by reading it.



Adventurer's Glossary

- Table:** Try standing on it.
- Talisman:** Magical artifact that when worn may protect you against evil spirits. Try waving it.
- Teardrop:** A valuable treasure.
- Tiara:** A treasure which can be worn with startling results.
- Thief:** Like the pirate he is best avoided if you are carrying valuable treasure.
- Tiger tooth:** You need to extract it from the tiger first! May have a use as a tool.
- Topaz:** Definitely a treasure.
- Torch:** Save it for use in dark places, but ensure that you can light it.
- Towers:** Nearly always need climbing and exploring. Look for a maiden in distress.
- Trap door:** Usually only opens from one side, so take care that you don't get trapped.
- Treasure:** It needs collecting and storing.
- Tree:** Climb it to see more of your surroundings.
- Trident:** When dropped it can draw water from the earth. Can also be used to fend off nasty creatures.
- Troll:** Nearly always unfriendly, so try killing it or avoiding it entirely.
- Tunnels:** They usually twist and turn, so map them carefully.
- Tusk:** It's ivory, so therefore a treasure.

Problems Solved

Craig Campbell asks how to open the manhole in **Project Thesius**. It is a simple matter of loosening the securing bolt with a spanner, Craig. In the same game Hugo Burchall asks where he can find the overalls. You will find them in the chest in the cave on the beach. The chest must be examined and you should press 640.

Craig is also experiencing difficulties finding the bucket in Larsoff's **Wychwood**. You will find it in the loft in the house. The bucket should then be filled at the pond in the country lane.

Five years after its launch on the Electron, **Sphinx Adventure** is still creating problems for readers. Karen from Basingstoke can't find the mouse which she will need to frighten the elephant. The little creature will be found scurrying around the dungeon of the vampire's castle. Tempt it with a morsel of cheese if you wish to catch it.

At a later stage P. Coates can't find the diamond. Go to the palace near the oilmounds and drop the mouse in front of it. He also asks what use the rag is. It is a valuable treasure, so take it to the Sphinx in the desert. He also says that he has used Diaxos to cover the safe but can't get into it. Go up

Diaxos will help you get back anything the troll takes, as he keeps it in a SAFE place.

Dermaid Collins wants to know how to get across the glacier. As long as you have got the ring you can use the wand.

To help many readers who have inquired about my bottle fix in the game, it works thuswise: When you get the "You can't carry any more" message, rub the ring and fill the bottle with water from the lake. Return to the object you wanted to pick up, drop the water, and you now find you can take the object. This works any number of times, and in essence gives you an unlimited inventory.

John Helfferman has explained a simple cheat in Acornsoft's **Countdown to Doom** - beware, as this will not work in the Topologika update of the game. To get unlimited moves plug in the game's rom cartridge and switch on.

Press **Escape** and then type **LOAD "DOOM2"** and when it has loaded list line 205 and after it to read:

285 IF FNRS(783)>B PROCM(286)

Trevor Davies wants to know if there is a way past the giant squid in Epic's **Kingdom of**

Klein. No, there is no need to even attempt it, Trevor. Martin Stubbs can't get across the lake. Go to the chapel, push the portrait and unlock the safe.

In **The Incredible Hulk H. Carroll** needs to know how to get the bio gam without the natter egg exploding. Try eating the egg.

Some tips to help George Jackson and others: In **Hampstead** the Sony Walkman is irrelevant, so try reading a magazine instead. The filing cabinet must be prised open using the screwdriver which you earlier pinched from the furniture department.

To finish the game, return to the Oxfam shop, change back into your old tracksuit, pick up the bike and walk into Hampstead with Pippa.

Henry Porter wants to know how to get the last treasure in Micropower's **Adventure**. Go to the scrubland past the dragon, drop one of your treasures and steal it back. Simple really huh?

Finally, Clyde King wishes to know where the keys are in **Adventureland**. Have you been up the tree, Clyde? And to get the golden fish you must use the bottle, but ensure that you have the golden net with you. More problems solved next month.

Don't miss out on the mass of material that's appeared in *Electron User* over the past few months. Bring yourself up to date with these back issue bundles. Each one is packed with games, utilities, features and programming tutorials.

Here's what you'll find in the July-October 1988 bundle:

July 1988 issue:

Games: Knockout Whist, Randall Rabbit, Tilley the Train, Tennis. *Utilities:* Shadow ram filing system, machine code score routines, Easy Reader. *Reviews:* Advanced Plus, *Spycat*. *Features:* Machine code tutorial, adventures, Memory Map part 3.

August 1988 issue:

Games: Fox and Geese, Solitaire. *Utilities:* Mini Prolog, disassembler. *Reviews:* E00 ADFS, Repton Thru Time, Barbarian, Romplus-144. *Features:* Machine code tutorial, adventures, Memory Map part 4.

September 1988 issue:

Games: Fire!, Bulls and Cows, Crypton, Oxo. *Utilities:* Sprite routines, Listif. *Reviews:* Anarchy Zone, Stranded, Round Ones, Times Computer Crosswords, Advanced User Guide. *Features:* Basic rom routines revealed, adventure tips.

October 1988 issue:

Games: Pistol Shooting, Spencer Spider, Gobbler. *Utilities:* Scroller, Rom Manager. *Features:* Rom routines revealed, adventure tips, Plus 1 hardware project. *Reviews:* Music 5000, Shark, Breakthrough, Plane Crash, Golf, Darts, Control Applications of Micros.

November 1988-February 1989 bundle:

November 1988 issue:

Games: Rally Driver, Bomber. *Utilities:* Elite Cheat. Disc and rom routines. *Features:* Using the Hybrid Music System. Adventure tips. Heyley interview. *Reviews:* Triple Deckers, Cheat it again Joe, Pipeline, Rebel Planet, In Search of Atahaulpa. DIY service manual.

December 1988 issue:

Games: Santa's Warehouse. Blow football. Senat board game. *Utilities:* Cut phone bills. Predict the pools. *Features:* Tape problems cured. Osfite routines explained. Floating point maths made easy. *Reviews:* Sam 4, Joe Blade, Frankenstein.

January 1989 issue:

Games: Sheep dog trials. *Utilities:* *WIPE command for ADFS users. Retirement fund planner. *Features:* Game cheats, pokes and tips. Screen scroller. Elkview noticeboard. *Reviews:* Play it again Sam 3, By Fair Means or Foul, Golden Figurine, Pegasus disc interface.

February 1989 issue:

Games: Slippery Sam. *Utilities:* Supercharge your programs. Verfy tape programs. *Features:* Random access filing. Adventure hints. Reverse Polish tutor. *Reviews:* Pixel Perfect DTP. Preparing for breakdowns.

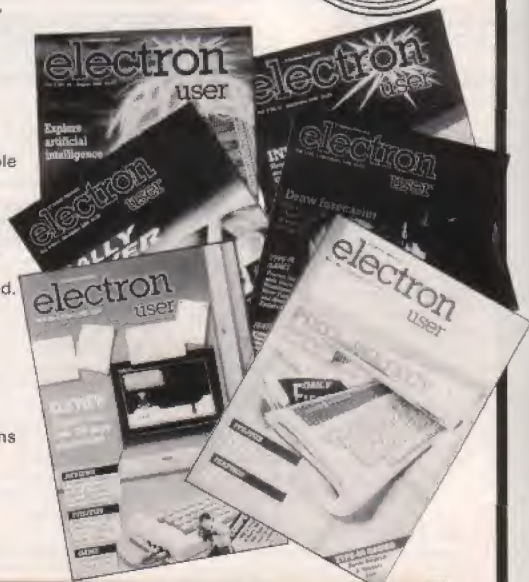
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Opening garbhit map number 2

The Nine Dancers

Take Shovel
Shovel

In dried
pond

Examine
pamphlet
Read
Envelope
Pamphlet

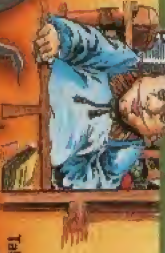
Antiques
Shop

General
Store

Break Urn
Alarm

Bus
shelter

Button
Litter bin
Examine bin



Village
Green

Tea Shop

Tables (Newspaper)
Take loaf

Inside
Tea Shop

Inside
Antiques
Shop



Path

Policeman

Lane

electron
TSC

Village
Inn



Listen
Examine bag
Bar-towel
Cotton

Inside
Village
Inn



Road

Haystack (needle)
search

Field

Dig
Urn

Road

Road

Field

Field

Examine
Scarecrow
(coat)
Tent peg
Dig





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THE INTERFACE FITS INTO ANY CARTRIDGE SLOT OF THE PLUS1, PLUS2 or ROMBOX PLUS and so does require one of these units.

The manual is 90 pages of what we consider to be constructive and well thought out information, being essential to raw beginners yet still contains all the relevant information for advanced users.

See Electron User JAN 1989 for review of PEGASUS

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Ask for details of accessories

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- ★ Battery backed SWR (approx £5.00 for the battery) (approx £20.00 for 32K RAM chip)

(Please note that although this unit is aimed at "RX" owners, it may be used without the RX even though there is no case.)

This product should be in stock by the time this advert appears in the Electron User.

Priced at £34.95, this must be one of the most attractive add-ons available to the Electron owner.

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The illustrator software is loaded from disc and contains all the programs and examples of what can be done with this package. The software is also programmed to print your creativity onto a printer.

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- RLOAD command to load Sideways RAM with a ROM image.
- RCM command to display ROM/RAM in system.
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*Printer Driver Generator ROM available to permit use of most non-Epson compatible printers.

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- Emulation of keys by Expansion ROM 2.0
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"The ultimate Joystick Interface"

A&B July 87

"Well worth saving up for, I can recommend it to all Arcade Addicts"

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This product is now available for the Electron computer through SLOGGER. For details see the Advanced Memory Systems advert in Acorn User or ring. This DESK TOP PUBLISHING package is supplied on 2 ROMs together with a SYSTEM disc and a FONT disc. In order to use this system which must rate as the most advanced yet, the Electron owner must have a standard 5.25 inch disk drive system (such as the PEGASUS 400 or equivalent) and have two spare ROM sockets to run the software. To benefit from the sophistication of the software, a MOUSE is a MUST and so the package is offered as follows:

STOP PRESS £49.95 USER PORT £19.95 MOUSE £19.95

PACKAGE PRICE £85 (limited period)

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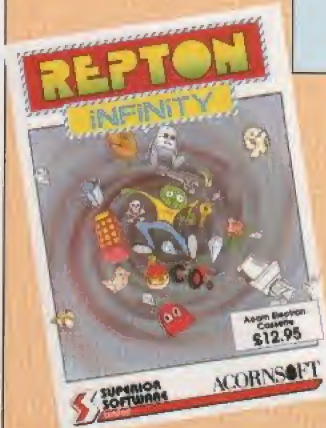
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SOFTWARE

The ultimate Repton?



IF you thought you'd seen every possible variation of that classic game, Repton, and that the theme had been done to death, hang on to your boots, as Repton Infinity – from Superior, of course – will blow your socks off. This latest incarnation of that lovable green skinned reptile has got to be the best yet.

There are four different games – and I don't mean four sets of screens for Repton 3 – and four utilities to enable you to write your own games. In the first game, **Repton 3 – Take 2**, you amass as many points as possible by collecting crowns and diamonds and disposing of the odd monster or two.

The usual gigantic eggs are scattered about ready to hatch into irksome monsters. Less difficult to shake off are large spirits which float about and can be trapped in cages which then turn into diamonds. Teleporters abound, but they can whisk you off into dead ends or traps if you're not careful.

Repton 4 is the second game and here your task is to grab banknotes conveniently left lying around among piles of jewels. Try to kill the ghouls that hatch out of the eggs, but watch out for the fungus that spreads like wildfire.

Magiblocks are special boulders that can be pushed up, down, left or right and when you get three in a row they turn into diamonds which can be collected for a bonus. Transporters are present as usual, and photocopyers are an additional feature. They can copy almost anything, but only work once.

Repton 4 is similar to Repton 3 with slight variations. The new features add a few puzzles and keep up the interest.

The third game is **Robbo**, and this departs even further from the traditional Repton gameplay. There are many similarities, but also quite a few differences. You control a small robot, and to test his intelligence he has been placed in a time-space puzzle vortex.

You have to collect the flashing orbs and solve a number of puzzles, like repairing a computer, lighting a bulb, putting a can into a

Product: *Repton Infinity*
Price: £12.95
Supplier: Superior Software, Regent House,
Skinner Lane, Leeds, LS7 1AX.
Tel: 0532 458453

fridge, mowing some grass and one or two more.

The last game, **Trakker** is probably the strangest of the four. You are the driver of a Jaffa – the Jagga Annihilation and Fruit Flinging Associates – and your mission is to dispose of all the hideous Jaggas and other nasties.

You are equipped with a bulldozer (a JCB GT7), sticks of dynamite, detonators and Killafruit. To use the dynamite you guide Kevin, your pal, to the dynamite, then run over a detonator. Jaggas can be squashed with tomatoes, but only from behind. And bananas

turn them into tubular spiders – all very strange, but fun.

Once you've mastered these four games you can get to grips with the Repton Infinity game creator itself. Four utilities are involved in the making of a game, the first being Film Strip, a sprite editor. Here you can modify an existing character or start from scratch and design a new one.

Once the characters have been formed you write a Basic-like program using a special editor and compiler. The purpose-designed language is called Reptol and is fairly straightforward, though like any programming language you'll need to put a fair bit of effort into learning it to get the most from it.

The 71 page manual provides descriptions of all the commands, plus a beginner's tutorial section. The commands include CHANGE to change one character into another, IF ... ELSE ... ENDIF and GOTO are like



In Robbo you control a small robot

REVIEWS

their Basic counterparts, KEY tests the Return key, SCORE increments your score, MOVE moves a character and so on.

Once the program logic has been created it's on to the Landscape Designer. This is where you design the maps that are used to create the landscape through which you move. The utility is quite simple and just involves picking up various characters and plonking them on the map. Skill is required in designing puzzles and traps, so be prepared for a little head scratching.

The final task to be done is to link all the files created – sprite, landscape and program logic – into one runnable program, and this is performed by the fourth utility File Link. This enables you to specify the filenames of the various parts so they can all be loaded in the right sequence.



The character designer

Repton Infinity is definitely the ultimate in this popular series. Not only are the four games superb – and all different from the standard Repton format – but the game creator is a stroke of genius.

I must admit to being a little bewildered by the number and variety of functions and options, and I have yet to create a full game. It'll take a fair bit of hard work, but not half as hard as writing the whole thing from scratch. Repton Infinity is an absolute must.

Roland Waddilove

Sound	9
Graphics	10
Playability	10
Value for money	10
Overall	10

Second Opinion

Wow! This is the best yet from Superior. The biggest case, the thickest manual, four great games with two sets of screens each and an amazing program creator that enables you to write your own Repton games in Reptal – a new arcade games writing language. At only £12.95 this has got to be amazing value for money. Well done Superior.

Janice Murray



You may confer

QUESTION of Sport fans, and no doubt there are quite a few, can now have a bash at this popular quiz game in their own homes, courtesy of Elite, Superior and Acornsoft – it's a crowded loading screen with all those logos.

You are soon greeted by the familiar smiling faces of David Coleman, Bill Beaumont and Ian Botham, and you can choose to be either Bill or Ian. Other options include a one or two player game and a choice of 25 question files. You can choose your specialist subject and two team mates from a board of well-drawn faces.

As in the television game, there are six rounds: Picture Board, Mystery Personality, Home or Away, What Happened Next, Quickfire and then back to the Picture Board to finish off.

I expected the Picture Board to be similar to the television, however, this would be asking too much of the Electron's graphics. Instead each square flips over to reveal an icon representing a sport.

A speech bubble appears over David Coleman's head and the question scrolls rapidly right to left. Four answers are displayed multiple-choice fashion and you must choose the right one within a time limit. If you don't, or you get it wrong, the question is passed over to the opposition.

The Mystery Personality round is the same in name only. You are given three clues, one at a time, as to a person's identity. Three points are awarded if you get it at the first clue, two at the second and one at the third.

The third round tests your specialist knowledge, or you can choose to play away and answer on a foreign subject. The fourth round is What Happened Next? Here an incident is described and you have to supply the answer.

The penultimate round is Quickfire Questions – everyone with their fingers on the buttons and the first to answer correctly gets

Product: Question of Sport
Price: £12.95
Supplier: Superior Software, Regent House,
Skinner Lane, Leeds LS7 1AX.
Tel: 0532 459453

the points. Finally it's back to the Picture Board to finish off the remaining squares.

The graphics are pretty good, with recognisable faces and well chosen icons, but there isn't much sound to speak of. If you like general knowledge, sport and trivia games you'll probably like this too. It's a fun game for all the family.

Jo Giles

Sound	3
Graphics	6
Playability	6
Value for money	7
Overall	8

Second Opinion

Question of Sport is a fairly good attempt at reproducing the excitement and fun of a TV quiz program. However, the game won't appeal to everyone, and there is a limited supply of questions, though it should take you quite some time to work your way through 25 files.

Janice Murray





The screen begins scrolling from right to left bringing a steady stream of alien creatures

DURING the next few months Impact is planning to release a number of top quality games at reduced prices, though not quite budget level. The first is Zenon, a one or two player arcade style action game with 250 levels.

Reading the packaging sleeve I soon discovered the game has no real plot. All you are told is that you have to penetrate all 250 levels of the game, a feat I am sure will require an extraordinary amount of stamina and concentration. Little wonder that the company has claimed it has yet to be achieved.

You are beamed down to the surface of the planet Zenon armed with a laser pistol and jetpack and the screen begins scrolling from right to left bringing a steady stream of alien creatures, missiles and other objects directly toward you.

You must either destroy them with your laser or avoid them by flying over or ducking under. Contact with any alien drains your energy. Fortunately, for the first few seconds after arriving on the surface you are immune to the hostiles' damaging effects. This gives

Program: Zenon
 Price: £4.95 (tape)
 Supplier: Impact Software, Neepsend House,
 1 Percy Street, Sheffield S3 8AU.
 Tel: 0742 769950

you time to make yourself comfortable and find the keys you need to play the game.

The two player option allows you and a friend to battle against the creatures simultaneously. Luckily, your weapons don't harm each other, and I found that you tend to stay alive a lot longer with a friend to back you up.

As always, the activity around the keyboard during a two player game can be quite frenetic, but, being a veteran at playing Dunjuz with four players hitting keys at the same time, playing with just one other player is a piece of cake.

You lose a life once your energy is depleted and losing four lives signals the end of the game. You will occasionally encounter a

weapon canister which, if it touches you, exchanges your current weapon with one contained in it. This can sometimes increase your damage-causing capability, but it can work the other way too.

It is possible to restore lost energy by either avoiding damage - thus allowing your spacesuit to recharge slowly - or by collecting energy cells which occasionally float by. To complete a level you must negotiate a distance of about 10 screen widths. This allows you to progress to the next, which is slightly more difficult and contains new creatures to zap.

Zenon has all the usual sounds associated with this type of game, but if you like a bit of peace and quiet you can turn them off. There is a high score table and a pause facility - nice to see them in such a reasonably priced piece of software.

Verdict? I found the game a bit too repetitive after a while. It failed to hold my attention for very long and I soon began to lose interest in running - or flying along - zapping the steady stream of creatures barring my path to the next level.

The designers must have spent a great deal of time on the sprites for the many different levels. There are aliens, androids, fireballs and missiles, but I'll probably never play this long enough to meet half of them.

If Impact can produce more games at the same price with the same excellent quality graphics as Zenon, but with more to them than just zapping aliens, the result might be nice little earners.

Desmond

Sound	7
Graphics	9
Playability	6
Value for money	8
Overall	8

Second Opinion

I QUITE enjoyed this mindless zap 'em arcade game. Don your spacesuit, pick up your trusty laser and go for a scroll on the moon blasting all and sundry to kingdom come.

The only bad points are that it does become a bit repetitive, and it's very similar to Rampage. There are a number of differences, but basically the idea is the same. Definitely worth a look.

Janice Murray

Zap-'em!



You are beamed down to the surface of the planet Zenon armed with a laser pistol

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

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Spreadsheet: Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates, or can be fed into its associated program . . .

Graphics: Part of the spreadsheet section, it lets you draw bar charts, pie charts and histograms to give a graphic presentation of your statistics. Helps to give life and colour to the dullerest figures!

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Cut above the average

THE Last Ninja is a story of jealousy, power, and revenge – of good versus evil and one man's struggle against overwhelming odds. Oh yes, I almost forgot, it is easily the best martial arts-cum-adventure game on the market.

For many years the evil Shogun had envied the closely guarded skills and secrets of the Ninja. Executing a dastardly plot he slaughtered the Ninja community on its once-a-decade visit to the sacred island of Lin Fen.

Unbeknown to the Shogun a solitary Ninja – Armakuni – had been left behind to guard the shrine, feed the cat and perform other such tasks. Now he has sworn to avenge the deaths of his comrades and re-build the Ninja empire.

You play Armakuni as he begins his assault on the island of Lin Fen. There are sixteen separate locations on the island and you must kill every guard and collect all available objects on each level before advancing to the next.

Control is achieved using the keyboard only – this may sound restrictive for a martial arts game, but it works well in practice. In addition to the direction keys there are also three separate jump buttons – each providing increasing distance. As if to demonstrate his supreme athleticism, Armakuni insists upon performing a forward somersault when prompted to jump.

Level one is set in the wilderness, a barren wasteland of rocks, bushes and thoughtfully provided paths for you to walk on, but it is patrolled by the Shogun's warriors. Inexperienced in the way of the Ninja, they do not yet possess your skills, but they are still capable of giving you a good thumping if you become careless.

Initially unarmed, you must pummel your opponents using only fists and feet. Things become a little easier as you round the first corner and find an abandoned sword – the first of five weapons available on level one. By pressing the spacebar you can quickly switch between any of the weapons currently in your possession. The instructions advise you to use the same weapon as your oppo-

Product: The Last Ninja
Price: £9.95 (tape)
Supplier: Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.
Tel: 0532 459453

nent, but I found the sword to be effective against most adversaries.

Unlike many games, you are not restricted to travelling in one direction, but are free to wander where you wish within the confines of the location. Another very welcome feature is the way that the guards stay dead once you have dealt with them – there is nothing worse than returning to a location and having to fight the same guard that you killed five minutes earlier.

Once you have mastered the human opponents, why not try your hand with the flaming dragon that guards the exit to level two?

The last Ninja is quite a departure from programmer Peter Scott's traditional style – the prolific author of countless cule platform

games has really come up with the goods this time. Ninja is fast, furious and totally addictive.

Jon Revis

Sound	7
Graphics	8
Playability	9
Value for money	9
Overall	9

Second Opinion

FROM the title and packaging I expected this to be just another ordinary martial arts beat-'em-up game. However, although it does have a fair proportion of combat, there is also an adventure element in that you have to explore your surroundings and discover weapons to take on the enemies. I like it, and can thoroughly recommend it.

Janice Murray



Putting the boot in



Find out - grab a friend and try out Jim Proctor's brain straining board game

TAKTIKS is an interesting board game for two players which is loosely based on that classic game Nim. This involves picking up matchsticks from the table, and the one who takes the last one is the loser.

In this computerised variation counters are placed in a four by four square. You take turns to go and you can pick up one, two, three or four adjacent counters, but they must be either in a vertical or horizontal line. Taking diagonals or counters which aren't next to each other is illegal. The object is to leave one remaining counter for your opponent. He picks up the last one and has therefore lost the game.

The screen shows a calculator-style display with the scores in the top left and right hand corners. All the counters are labelled with a letter and you'll be prompted to input the ones you want to remove when it is your turn.

Enter up to four letters - they must be in alphabetical order - and press the Return key. Remember that the counters must be next to each other, otherwise the program will keep annoyingly at you and prompt you to enter your choice again.

You take turns to start, the one going first having a slight advantage. Tactics and strategy, plus an ability to think ahead are required in order to succeed. Have you got what it takes to become an expert? Grab a partner and see.

NIMBLE witted?

SCORE: (A) 0

SCORE: (B) 0

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

Player(B) TO GO

Remove up to 4 adjacent letters from only one row or one column
 LEAVE just ONE letter to WIN!!!
 SELECT your letters now....

```

10 REM TakTiks
20 REM By Jim Proctor
30 A%=0:B%=0
40 DIM pLak$(15),row$(4),col$(4),pL
c$(4),aach(4)
50 REPEAT
60 MODEL
70 PROCInit:PROCscm
80 REPEAT:PROCmove
90 UNTILcount=C2
100 PROCend
110 UNTIL FALSE
120 END
130 :
140 DEFPROCInit
150 V0223,240,0,0,0,0,255,255,0,0,0
160 V0223,241,24,24,24,24,24,24,24,2
4
170 V0223,242,0,0,0,7,15,28,24,24
180 V0223,243,0,0,0,224,240,56,24,24
190 V0223,244,24,24,24,28,15,7,0,0,0
200 V0223,245,24,24,56,240,224,0,0,0
210 top$=CHR$(242)+CHR$(240)+CHR$(243)
220 bot$=CHR$(244)+CHR$(240)+CHR$(245)
230 lInk$=CHR$(246)+CHR$(241)+CHR$(247)
240 lInk$=top$+lInk$+CHR$(241)+CHR$(24+
CHR$(241)+lInk$+Hot$
250 RESTORE
260 FOR I=LTO4
270 READrow$(I),col$(I):NEXT
280 ENVELOPE1,1,0,0,0,0,0,126,-1,-
1,-1,126,0
290 V0219,1,2:0:19,3,5:0:
300 ENDPROC

```

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```

310 DATA ABCD, EFGH, IJKL, MNOP
320 DATA AQM, BRJN, CGPD, DHEP
330 :
340 DEFPROCaccm
350 count:=1:turn:=2*PIB(2) - 3
360 VDU17, 3, 17, 129
370 PRINTTAB (11, 1) SEPC17:IB (11, 2) " T
A K T I K S " TAB (11, 3) SPCL7
380 VDU17, 2, 17, 128
390 VDU5:GCOL0, 2
400 NOVELL*32-4, 1023-28
410 DRWZ8*32, 1023-28
420 DRWZ8*32, 1023-32*24
430 DRWZ8*32-4, 1023-32*24
440 DRWZ8*32-4, 1023-28
450 NOVELL*32-4, 1023-4*32
460 DRWZ8*32, 1023-4*32
470 NOVELL*32-4, 1023-32*21
480 DRWZ8*32, 1023-32*21
490 VDU4
500 FOR:1=0:15
510 x:=1:MD4:y:=1:MDIV4
520 plak$ (I$) =cp$+lnk$+CHR$(241+CHR$(
(65*I$)+CHR$(241+lnk$+hot$
530 PRINTTAB (4*x+12, 4*y+5) plak$ (I$
)
540 NEXT
550 COLOUR1
560 PRINTTAB (4, 1) "SCORE: "TAB (4, 3) " A
": "A:
570 COLOUR3
580 PRINTTAB (30, 1) "SCORE: "TAB (30, 3)
(B) " :B:
590 COLOUR2
600 PRINTTAB (4, 25) "Remove up to 4 ad
jacent letters" / " from only one row

```

```

or one column"
610 PRINT " LEAVE just ONE letter
to WIN!! "
620 VDU7
630 DEFPROC
640 :
650 DEFPROCmove
660 cl:=I$E
670 IF turn=1:col:=1:pitch:=149:pl$=""
A ELSE:col:=3:pitch:=165:pl$="B"
680 COLOURcol
690 PRINTTAB (12, 22) "Player ("pl$") " :
700 COLOUR2:PRINT " TO GO"
710 REPEAT
720 COLOURcol
730 PRINTTAB (30, 30) SPC5
740 INPUTTAB (4, 30) "SELECT your lette
rs now... " :L$:
750 PROCest
760 IF cl=FALSE SOUND, -10, 0, 8
770 UNTIL cl=TRUE
780 SOUND, 1, pitch, 8
790 FOR:1=0:15:LENL$
800 pic$ (J$) =MID$ (L$, J$, 1)
810 asc$=ASC (pic$ (J$)) -65
820 y:=asc*MD4:y:=asc$DIV4
830 COLOURcol
840 PRINTTAB (4*y+12, 4*y+5) blank$
850 plak$ (asc$) =""
860 NEXT
870 count:=count+1:LENL$
880 turn:=turn+1
890 DEFPROC
900 :
910 DEFPROCest
920 cl:=I$E
930 IF LEN L$=4 OR LEN L$=count+1 OR
LEN L$=0 cl=FALSE:ENDPROC
940 I$=I$:tot:=0:REPEAT:R:=INSTR (row$
(I$), L$) :cl:=INSTR (col$(I$), L$) :tot:=to
t+R+cl
950 I$=I$+1:UNTIL R>4:IF tot=0 cl=FA
LSE:ENDPROC
960 J:=1
970 REPEAT
980 pic:=MID$ (L$, J$, 1)
990 IF plak$ (ASC (pic$) -65)="" cl=FALSE
E:J:=J+1
1000 asc$ (J$) =ASC (pic$) -65
1010 J:=J+1
1020 UNTIL J=LENL$
1030 IF cl=FALSE OR LENL$=1 ENDPROC
1040 J:=2
1050 REPEAT
1060 diff:=ABS (asc$ (J$) -asc$ (J$-1))
1070 IF diff<=0:AND:diff<=4 cl=FALSE:J
:=J+1
1080 J:=J+1
1090 UNTIL J=LENL$
1100 ENDPROC
1110 :
1120 DEFPROCand
1130 PRINTTAB (4, 25) SPC240:
1140 IF turn=1 B:=B+1 ELSE A:=A+1
1150 COLOUR1:PRINTTAB (8, 3) :A:
1160 COLOUR3:PRINTTAB (34, 3) :B:
1170 COLOUR2:PRINTTAB (21, 22) " WINS!! " :
1180 FOR:pitch=10:149:STEP4
1190 SOUND, 1, pitch, 1:NEXT
1200 FOR:pitch=149:10:STEP-4
1210 SOUND, 1, pitch, 2:NEXT
1220 COLOUR2
1230 PRINTTAB (5, 26) "Press RETURN to c
ontinue... " :
1240 dummy=GET
1250 ENDPROC

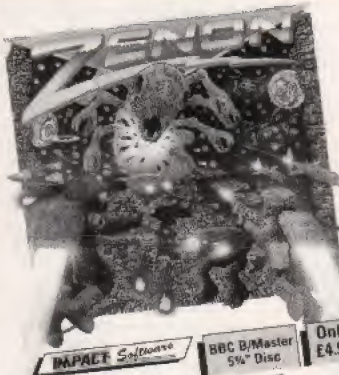
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Taking discs apart

Roland Waddilove shows how the DFS directory of files is structured

THIS second article in our series investigating discs is devoted to exploring the disc filing system's directory structure. Not only is it interesting looking at how the DFS stores the information related to each file — like its name, length, load and execution addresses — but it is also useful to know how to reconstruct it when things go wrong and you lose a file.

The DFS directory occupies the first two sectors on the disc — Figure 1 shows a hex/Ascii dump of a typical one. The first eight characters of the 12 character title are stored in the first eight bytes of sector one. You can see R.Waddil in the screen dump.

The rest of the sector is devoted to storing the names of up to 31 files — the maximum the DFS allows you to store on one disc. Each filename can be up to seven characters long — if it's shorter it is padded out with spaces — plus a one character directory name. When a file is locked with *ACCESS bit seven of the directory byte is set. Figure 1 shows this quite clearly.

That's the easy part. Sector two, the second half of the directory, is much more complicated. It starts off with the last four bytes of the disc title — ovel — in Figure 1. Byte 260 — counting from zero at the start of the directory — stores the number of times the disc has been written to.

Byte 261 holds the number of files saved on the disc multiplied by eight. The upper nybble of the next byte is the boot option as set by *OPT4. The lower nybble plus the whole of the next byte — byte 263 — holds the number of sectors on the disc. With 40 tracks and 10 sectors per track, this will be 400 — or &190 in hexadecimal.

The rest of the directory is used to store the file pointers for the 31 files. These correspond exactly to the filenames in the first sector. So the first file's pointers in sector two belong to the first filename in sector one, the second file's pointers belong to the second filename and so on. Each file's pointers occupy eight bytes.

Bytes zero and one of a file's pointer list contain the least significant 16 bits of the load address — normally this is all you need, however, the others are used if you have a second processor. In Figure 11, bytes 264 and 265 hold &1900 the load address of the first file.

Bytes two and three hold the least significant 16 bits of the execution address. In Figure 11 bytes 286 and 287 hold &8023, indicating that this is a Basic program. Bytes four and five contain the least significant 16 bits of the file's length.

The sixth byte is used to store the most significant two bits of the execution address, length and load address in bits seven and six, five and four, three and two respectively.

The only missing information the DFS requires is where the file is physically located on the disc. The top two bits of the sector number are held in bits one and zero of the sixth byte, and the remainder of the bits are stored in the seventh, final byte.

As you can see, the file pointer list is quite complicated and to extract the information

The 31 filenames follow the title and are seven letters long

The first eight bytes of the disc title

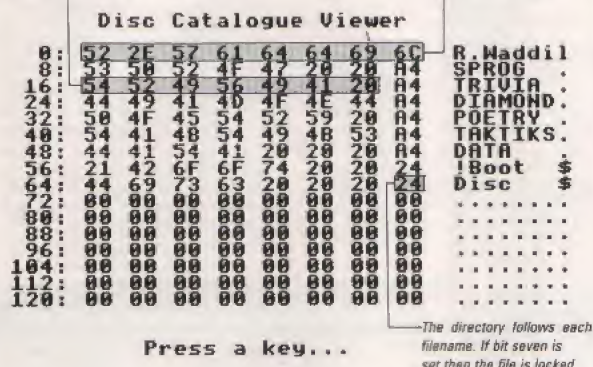


Figure 1: The first sector of the directory holds the first eight bytes of the title and the 31 filenames

The last four bytes of the title

The number of times the disc has been written to

Eight times the number of files on the disc

The boot option — *OPT4 parameter

The number of sectors on the disc

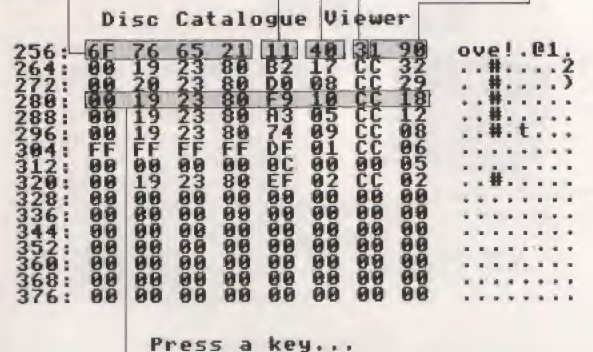


Figure 11: The rest of the disc title, some disc information, and the 31 files' pointers are stored in the second sector of the directory

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you'll have to take bytes and mask off the bits you don't need, then add in other bytes, and so on. Not an easy task by any means.

The listing is a Basic program that allows you to examine a disc's directory. Simply pop a disc in the drive and run it. The information is printed out in hexadecimal and Ascii in 128 byte chunks. Press a key to move on to the next chunk.

An osword call - &7F - is used to read the directory sectors straight off the disc. Osword &7F can perform a variety of functions, from reading and writing individual sectors to formatting a whole track. A parameter block is used for reading sectors and it must be 11 bytes long. Here is how it is structured:

- Byte 0 = Drive
- Byte 1-4 = Buffer address
- Byte 5 = Number of parameters
- Byte 6 = Function number
- Byte 7 = Track number
- Byte 8 = Sector number
- Byte 9 = Sector size/number
- Byte 10 = Used to report errors

The number of parameters in byte five is three in our case - the track, sector and sector size/number. The osword function number in byte six is &53. Bytes seven and eight hold the track and sector number.

Byte nine has a dual function. The top three

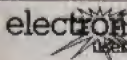
```

10 REM Read catalogue
20 REM By R.A. Reddillove
30 REM (c) Electron User
40 MODE 5
50 VDU 19,0,4,0:
60
70 DIM buffer 550
80 DIM block 11
90
100 osword=&FFF1
110 drive=0
120 track=0
130 sector=0
140 parameters=3
150 command=&53
160
170 ?block=drive
180 block=1+buffer
190 block=5+parameters
200 block=6+command
210 block=7+track
220 block=8+sector
230 block=9=&22
240 A=&7F
250 X=&block MOD 256

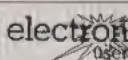
260 Y=&block DIV 256
270 CALL osword
280 IF block/10<0 PRINT "Error":END
290
300 @=&6000904
310 FOR K=0 TO 3*128 STEP 128
320 GOSUB
330 PRINT TAB(7,2) "Disc Catalogue V1
case:"
340 PRINT
350 FOR I=0 TO 15*8 STEP 8
360 a$=""
370 PRINT I+EK$;" ";
380 FOR J=0 TO 7
390 byte=? (buffer+I+J*8)
400 IF byte<32 OR byte>126 a$=a$+" "
ELSE a$=a$+CHR$(byte)
410 PRINT " ";byte DIV 16;"-byte MOD
16:
420 NEXT
430 PRINT " ";a$
440 NEXT
450 PRINTTAB(10,22) "Press a key...";
460 clrscr:GOTO
470 NEXT
    
```

bits tell the disc controller how many bytes there are in a sector, and a value of 1 is required in our case to specify a size of 256 bytes. The least significant five bits represent the number of sectors per track - 10 on a DFS disc. So byte nine must be set to &22 to read the two directory sectors.

Line 70 in the program reserves 550 bytes of memory to store the two sectors, and line 80 reserves 11 bytes for the parameter block. Lines 170-239 set up the parameter block and then the osword function is called. The remainder of the program is devoted to displaying the data loaded into the buffer.



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Now available through PRES **Advanced Computer Products** range of software products

ADVANCED CONTROL PANEL

(20) /M/B/E/C £30 ex VAT £34.50 inc VAT
ACP is a front end control panel language providing a sophisticated yet friendly interface between user and computer for access to Languages, MOS functions and the users own file utility etc. Main features include pull down windows, simple to change MOS configure, floating point calculator, file manager, SW ROM's facilities

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"ACP is much better than any of the other front end systems I've seen." - *Acorn User, August 1987.*

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- ACP's main features are:-
- * Pull down windows operate throughout
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 - * Simple to change MOS-s configure options
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 - * File manager
 - * Floating point calculator

ADVANCED DISC TOOLKIT

(01) /M/B/E/C £30 ex VAT £34.50 inc VAT
Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd & co-processors A.C.P.'s BEST SELLING product containing over 30 commands inc:- powerful memory & disc editor, search memory/disc/basic, catalogue/mainframe ROMS, loadrun programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc. etc ("I's superb", Database Pubs. - "A top-class toolkit. I have no hesitation in recommending it." - *Acorn User Nov. 86*)
(16K EPROM + FULL MANUAL)

ADVANCED ELECTRON DFS Egg

(14) /E+ASR/ £17.99 ex VAT £19.99 inc VAT
An alternative to the DFS on rom for Plus 3 and ABR users. This optional alternative DFS is designed for use in Sideways RAM (ABR) and allows the user to operate a disc filing system & Egg when using the Plus 3 (in ADFS page would normally be & D&E). The DFS is simply loaded using the software supplied with the ABR from disc. (3.5" ADFS disc + manual)

ADVANCED ELECTRON DFS

(05) /E/ £21.00 ex VAT £24.15 inc VAT
Electron & Plus 3 users... gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+. Now you can produce and access (compatible) BBC disc based software. We can also supply 5.25" disc drives to add to your Plus 3 (inc. 2nd. drive adapter). ACP has produced another superb ROM for the Electron... *Electron User Feb '86* (supplied on 16K EPROM + DFS MANUAL)

ADVANCED DISC INVESTIGATOR

(06) /M/B/E/C £25 ex VAT £28.75 inc VAT
A very powerful Disc utility for standard & non-standard discs. Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40 track discs to 80 track discs, verify two non-standard discs... (ADI features an extremely comprehensive sector editor, and one of the finest I've seen"... Tubelink on Prestel) (supplied on 16K EPROM + manual)

ADVANCED 1770 DFS

3 versions ADM/C(11) - AD9(12) ADE (13) £30.00 ex VAT £34.50 inc VAT
ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is a very fast and powerful disc filing system with the ability to operate in double density occupying both sides of a disc (840K). Automatic file relocation, improved file handling, 82 file catalogue and Sways RAM can be used as a fast RAM DISC. (16K EPROM + comprehensive manual)

PRES - ADVANCED FILE MANAGER

The ultimate 'front-end' for ADFS and DFS includes:

- Menu** - infinitely expandable
Delete - deletes any number of files
Rename - rename multiple files using wild-cards
- Copy** - extremely comprehensive file copier

AFM has four distinct modes:

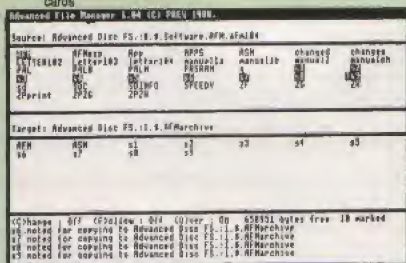
MENU - allows browsing through the files and directories on a disc. Files are started from a menu of up to 7 options chosen for a selected ROM. Loaders are provided for Basic, The Basic Editor, View, ViewSheet, ViewStore, ViewSpell, Edit, Wordwise (+) and InterWord. This list can be expanded infinitely using an Acorn-approved OSWORD call... full details and example in the manual.

DELETE - allows files to be marked and then deleted with one keystroke.
RENAME - allows one or more files to be marked and then renamed using a wildcard name, ie one which varies with each file renamed. Thus you could rename s1, s2 and s3 to be s1_old, s2_old, and s3_old in one operation... and that's only the beginning! As well as using the whole of the original name you can also pick out individual characters to form part of the new name.

COPY - the strongest feature of AFM. It is a two stage copy routine. With both source and target directories shown on screen the files to be copied are marked. Once all the files have been marked copying is started and the computer can be left to get on with it!
Large files can be split across several disks, and recombined.

As much as possible of the computer's memory is used for copying files, including unused parts of shadow screen memory, sideways ram banks (inc. AP7), ram cartridges (inc. ABR (32K) and AQR (256K)), tube memory (up to 61K), B+ paged ram (12K) and unused parts of the Slogger Master Ramboard (Electron).

Comprehensive error trapping and recovery is provided, so a copying run will rarely have to be aborted unfinished! And there's much, much more.



AFM follows the PRES 'Master Plan' of upwards compatibility - it runs on Electron, BBC B, B+, B+128, Master 128 and Compact, with Second/Co-processors and Acorn-compatible versions of DFS & ADFS.
£25 ex VAT £28.75 inc VAT

DATABASE PUBLICATIONS: Electron software now available exclusively through PRES on 3.5" disc

Electron User 1988 Monthly Disc	£4.75	10 of the Best Vol 2	£6.95
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*Arcade Game Creator	£5.95	10 of the Best Vol 4	£6.95
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5.25" disc versions available only
*Arcade Game Creator £5.95
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*Back issues of Electron User required, see Database Publications own advertisement

PRES

THE ADVANCED PLUS 3

Now you can turn your Electron +1 into a full disc system - no more waiting for tape loading or 'bad block/data?' messages. A.P.3 gives you:

1. A fully Acorn compatible 1770 interface
2. 80 track 3.5" disc drive, as used by Acorn (320k capacity)
3. Separate PSU
4. Acorn ADFS
5. Welcome disc
6. Utilities
7. Full documentation
8. All the advantages of the original Plus 3

All this without dramatically increasing the required desk space! Now well into the SECOND THOUSAND production.

Remember - 2nd drives (3.5 or 5.25) can be added and the AP3 drive can be used on a BBC or Master computer! Also most Electron disc-based software is supplied on 3.5" ADFS discs.

The only fully compatible disc upgrade running Acorn's own preferred filing system (supplied on Plus 3, Master 128, Master Compact and now the Archimedes)

EXTRA BONUS

3 games on disc - SNAPPER - DRAUGHTS - REVERSI!

COMPLETE PACKAGE ONLY

£109.50 excl VAT; £125.93 incl VAT

ADVANCED PLUS 5

A unique interface for those wanting the maximum expansion from just one slot in the PLUS 1. AP5 contains a User port for connecting peripherals such as a mouse, 1 MHz bus allowing Music 5000(E), primmers and various control devices to be added. Tube interface for connecting an Acorn 2nd processor or even a Master Turbo board (through a 'Co-Pro Adaptor') - & TWO spare ROM sockets (1 high priority). All hardware connections are Acorn compatible thereby allowing many BBC products to be added (remember that some software modification may be necessary for the Electron). So although some expansion options may appear expensive on an Electron you do have upward compatibility.

£58.00 Ex VAT; £68.24 Inc VAT

ADVANCED PLUS 1 - The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, ViewSheet, Pascal, Logo, and our own popular range of disc upgrades.

£60.00 excl VAT; £57.50 Inc VAT

ADVANCED PLUS 6 - A fully buffered 5 ROM expansion module for the Electron user. AP6 is fitted inside the advanced Plus 1 or a modified Acorn Plus 1 (when used with the Acorn Plus 3, 5 ROM sockets are available). All sockets are designed to accept either ROM/EPROMS or RAM chips. A further feature is the optional AP7 upgrade.

"A marvellous piece of design" - don't hesitate, buy it! - EU, May '88

£33.00 excl VAT; £37.95 Inc VAT

UPGRADE SERVICE for the original Acorn Plus 1 to Advanced Plus 1 and AP6. This will provide all the benefits of AP6 and also includes the printer circuit modification for some modern printers. (AP6 can be fitted to original Plus 1 by users with soldering experience) for upgrade service add £7.00 + VAT to AP6 price i.e.

£40.00 excl VAT; £46.00 Inc VAT

Incl. Mod. Fitting + Testing + Carriage. Send to:
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ADVANCED ROM ADAPTER 2

An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8k or 16k EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use - No switching - complies fully to the Acorn (sideways) Rom filing system.

"The best ROM cartridge is by far the ARA 2...ABR Dec 86"

£13.00 excl VAT; £14.95 Inc VAT

ADVANCED BATTERY-BACKED RAM

A standard Acorn approved cartridge but containing 32k (2 x 16k) of sideways RAM. The added bonus is the battery-backed feature that holds the RAM contents when the power is switched off. Different ROM images can be loaded into either bank from ROM images previously saved. The banks can also be locked to imitate ROM use. Now it is possible to have View & ViewSheet in one cartridge every time you switch on. Other uses include &E00 ADFS, printer buffer, ROM software development. The use of ABR is simplified by the newly written PRES software utilities which include: SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put your own software from disc or tape into ABR & use the ROM filing system. All software is supplied in ABR with a simple menu to transfer the utilities to your own media. No hardware switching - totally software controlled. Instructions for using supplied software and necessary information for users developing their own applications.

"It's a superb act-on and a must for all serious Electron users."

Electron User

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PRES POLICY

1. To provide the best possible service & assistance to users.
2. Supply Acorn based or Acorn compatible products & to enable upward compatibility wherever possible.
3. Provide tested products with special attention to quality of design, components & production.
4. "Only to cash cheques & credit card receipts when we know we can supply the goods ordered."

DISC INTERFACES (Plus One required)

AP3 INTERFACE: As supplied with AP3 package. A fully Acorn compatible disc interface that will accept any standard 5.25" or 3.5" 80T drive with PSU. It runs Acorn's ADFS (as supplied on Acorn Plus Three, Master 128, Master Compact and now the Archimedes) supplied with A.D.F.S. manual and welcome disc + Utilities and 3 bonus games (please specify 3.5" or 5.25" 80T format). Also provides a spare 16K rom socket. Price £52.00 ex VAT £59.80 Inc VAT

AP4 INTERFACE: A fully Acorn compatible disc interface that will accept any standard 5.25" or 3.5" drive with PSU. It runs the 1770 DFS (as fitted in the BBC 'B' and Master) keeps pace at &E00 - has utilities in rom and provides a spare 16K rom socket (DFS manual included). Price £60.83 ex VAT £69.95 Inc VAT

AP4 INTERFACE: Get the best of both filing systems. Now available from PRES the ultimate interface. Fitted with both Acorn approved filing systems... Acorn's current standard ADFS and Acorn 1770 DFS (which can be run at &E00) ADFS and DFS manuals supplied + ADFS welcome disc with utilities. Price £69.55 ex VAT £79.98 Inc VAT

Please state 5.25" or 3.5"

ADVANCED PLUS 2 ROM

We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3 & ABR users. Now with this easy to fit upgrade you can add:

1. Fix for Tape filing system in Hi-res screen modes.
2. "ROMS" - to display all ROMs/ROM images present on the system.
3. "UNPLUG" - disable ROM/RAM image.
4. "INSERT" - enables or inserts a previously unplugged ROM.
5. "KILL" - to totally disable the Plus 1.
6. "LOCK" - to lock a sideways RAM bank in ABR, AQR, AP7.
7. "LROMS" - to lock all sideways RAM banks found.
8. "UNLOCK" - to unlock a sideways RAM bank in ABR, AQR, AP7.
9. "LROMS" - to unlock all sideways RAM banks found.
10. "SAVEROM" - saves a copy of a ROM image to the current filing system.
11. "LOADROM" - loads a ROM image from the current FS into a ROM bank.
12. "FORMAT" - will format an ADFS disc for Plus 3 or AP3.
13. "VERIFY" - reads and tests every sector on an ADFS disc.
14. "VFORM" - formats and verifies an ADFS disc in one command.
15. "BUILD" - creates a text file that can be used by "EXEC (ie IBOOT).
16. "LIST" - displays a numbered listing of a text file.
17. "TYPE" - displays a file on screen with no line numbers.
18. "DUMP" - to view a file's contents on screen.
19. "LANG" - selects a default language to be booted on <CTRL-BREAK>
20. "HELP" - provides a full 'help' list on all the ROM's commands "STOP PRESS"
21. "AORPAGE" - selects the specified page in any AQR present.

Now there is no need to search for your utilities disc every time you want to Format/Verify a disc, Build a Iboot file or Lock/unlock/Load a ROM image into ABR PLUS much more... the ideal companion for the company that produces the Acorn Plus 1.

£11.00 ex VAT; £12.65 Inc VAT

"The AP2 is the definitive Plus 1 Rom... I'm not sure who I'd without it... Like all of PRES's other products it's been well worth waiting for." EU July '88

PRES ABR SOFTWARE

The new PRES ABR software now available separately containing: SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put our own software from disc or tape into ABR & use the ROM filing system. Supplied on 3.5" ADFS or 5.25" DFS disc.

£5.29 ex VAT; £11.49 Inc VAT

5.25" £8.99 ex VAT; £10.34 Inc VAT

ADVANCED PLUS 7

An internal battery-backed RAM upgrade for the Advanced Plus 6. TWO 16K pages of Sideways RAM, battery-backed and featuring full write protection facility. Just like ABR but fitted internally & vacating a cartridge slot. This product is compatible with all Acorn BBC/Master & Electron computers.

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A new low cost unit for those who just require a user port interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket which can also be configured for high priority use such as mouse software.

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ADFS VERSION 1.1

Suitable for existing Plus 3 or A.P.4 users. This new version has the software files for Zryshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle AQR as a 256k RAM DISC. Please note - ADFS is Acorns adopted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 16k ROM with Welcome disc & utilities. Please state 3.5/5.25" welcome disk.

£14.95 ex VAT; £17.19 inc VAT
(ADFS manual supplied separately)

ADFS E00

For Electron users with either Plus 3 or A.P.4 and 32k of 5W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM! Includes all the software 'fixes' as in version 1.1 as well as the AQR/RAM DISC code and an 'FX' call for managing the new & original ADFS. One of the most frequent questions we are asked: "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS & E00 regains 3.75k leaving page @ &E00 the same as Tapel

ADFS E00 supplied; 3.5" ADFS (manual available separately)
£14.95 ex VAT; £17.19 inc VAT

5.25" ADFS (manual avail. sep.) £14.00 ex VAT; £16.10 inc VAT
5.25" DFS (2 discs + ADFS manual) £19.00 ex VAT; £21.85 inc VAT
(See Special Package Prices)

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This converts an AP3 to an AP4 (i.e. DFSECO) supplied as a two chip set, full documentation and fitting instructions.

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A.D.F.S Guide Manual £5.00

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VIEW & VIEWSHEET . . . both products as above *special price* £22.00

MUSIC 5000
Turns your Electron into a computerised music production studio in which you can take a piece of music all the way from a sheet score, an idea of your own or one of the supplied examples, through entry, arrangement, replay and 'live' mix-down to a finished performance complete with custom instruments and studio effects.
Music 5000 is supplied as a powerful, stereo, digital, eight voice, 16 channel synthesiser with ROM software (containing the AMPLE language), disc software containing the example music files and full documentation.
The requirement for Electron Music 5000 is . . . Electron, Plus 1, disc system (3.5 or 5.25 drive) running DFS or ADFS (preferably @ &E00) i.e. Acorn Plus 3, A.P.3 or A.P.4, 1 MHz bus (best option A.P.5.), and hi-fi amplifier or similar (Music 5000 has a standard 5-pin DIN audio connector for sound output). (Please state disc size & FS when ordering) £99.00 ex VAT £113.85 (inc. VAT)

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ACCESSORIES

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For those who are fed up with removing the power connector every time when resetting the computer or for those whose jack-plug connector has become unreliable by removing the power at random! This useful accessory provides a double-pole in-line switch with a new power jack-plug already attached; just connect to the existing lead, having removed the old jack-plug. £3.96 ex VAT; £4.55 inc VAT

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Converts the fitting at the back of the original Acorn Plus 3, to take a standard disc drive connector when adding a second drive which has been configured to Drive 1.
£6.91 ex VAT; £7.95 inc VAT

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ELECTRON ADVANCED USER GUIDE . . . further reading and information for the Electron user. £3.95

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5 adventures available on disc for Electron users. Each game is sold separately on disc: Ultimate Prize, Dreamtime, Pirates Peri, Taroda Scheme and Stranded.
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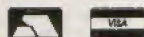
COMING SOON

ADVANCED BASIC EDITOR . . . an exciting new product based on Acorn's original Basic Editor. It contains all the original features plus enhancements that make it one of the most powerful basic editors available. Supplied as a 32K ROM module or a cartridge with spare ROM socket.

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Page Missing


```

F I.....*.....*.....*.....*.....*.<
*How many keys are there on the
  Electron's keyboard?
*56
*52
*58
*ADFS is an abbreviation of...
*Advanced Disc Filing System
*A Disc Filing System
*A Floppy Disc System
*What is the microprocessor at the
  heart of the Electron?
*An 8 bit 6502 chip
*An 8 bit 780 chip
*A 16 bit 68000 chip
*When was the first issue of
  Electron User published (in its
  pull-out form in The Micro User)?
*October 1983
*January 1984
*March 1984
@
*****

```



```

When was the first issue of
Electron User published (in its
pull-out form in The Micro User)?

```

1. January 1984

2. March 1984

3. October 1983

Score: 4/5 = 80%

Press 1, 2 or 3: 3...Correct!

A question and three alternative answers are displayed on the screen

Trivia Test

Loading data file

Thinking...

The questions and answers are loaded from a separate data file

```

820 ?(6900+Q8*2)=?(6900+R8*2)      930 UNTIL ?ptr=ASC"" OR ?ptr=ASC"@"
830 ?(6900+R8*2)=?R8                940 ENDFPROC
840 ?R8=? (6901+Q8*2)                950
850 ?(6901+Q8*2)=?(6901+R8*2)      960 DEF PROCCLS
860 ?(6901+R8*2)=?R8                970 VDU 26
870 NEXT                             980 FOR I=1 TO 5
880 ENDFPROC                         990 PRINT STRLEN$(200,CHR$(224));
890 DEF PROCQST                       1000 NEXT
900 REPEAT                            1010 ENDFPROC
910 ?ptr=ptr+1                        1020
920                                     1030 DEF PROCWINDOW (X%, Y%, W%, H%)
930 UNTIL ?ptr=ASC"" OR ?ptr=ASC"@" 1040 VDU 28, X+1, Y+1+H8, X+1+W8, Y+1
940 REPEAT                             1050 COLOR 128:CLS
950                                     1060 VDU 28, X, Y+H8, X+W8, Y
960 ptr=ptr+1                         1070 COLOR 129:CLS
970 dummy$=dummy$+CHR$(?ptr)        1080 VDU 28 X+1, Y+H8, X+W8, Y+1
980 IF ?ptr=13 dummy$=dummy$+CHR$(10 1090 ENDFPROC
990 )                                  1100
1000 UNTIL ptr=ASC"" OR ptr=ASC"@"  1110 DEF PROCQUESTION
1010 ptr=ptr+1                        1120 ptr=(6900+question*2) AND 65535
1020 dummy$=dummy$+CHR$(?ptr)        1130 PROCWINDOW(1, 1, 36, 5)
1030                                     1140 Q8=FNGET
1040                                     1150 PRINT Q8
1050                                     1160 R8=END(-TIME)
1060                                     1170 R8=END(3)
1070                                     1180 IF R8=1 AS(1)=FNGET:AS(2)=FNGET:
1080                                     AS(3)=FNGET:
1090 IF R8=2 AS(2)=FNGET:AS(3)=FNGET:  1190 IF R8=3 AS(2)=FNGET:AS(3)=FNGET:
1100 IF R8=3 AS(1)=FNGET:AS(1)=FNGET:  AS(1)=FNGET:
1110 PROCWINDOW(1, 9, 36, 2):PRINT"1. ";A  1200 IF R8=3 AS(1)=FNGET:AS(1)=FNGET:
1120                                     AS(2)=FNGET:
1130 PROCWINDOW(1, 13, 36, 2):PRINT"2. ";  1210 PROCWINDOW(1, 9, 36, 2):PRINT"1. ";A
1140                                     $(1);
1150 PROCWINDOW(1, 17, 36, 2):PRINT"3. ";  1220 PROCWINDOW(1, 13, 36, 2):PRINT"2. ";
1160                                     AS(2);
1170                                     1230 PROCWINDOW(1, 17, 36, 2):PRINT"3. ";
1180                                     AS(3);
1190                                     1240 ENDFPROC
1200                                     1250
1210                                     1260 DEF FNGET
1220                                     1270 dummy$=""
1230                                     1280 REPEAT
1240                                     1290 ptr=ptr+1
1250                                     1300 dummy$=dummy$+CHR$(?ptr)
1260                                     1310 IF ?ptr=13 dummy$=dummy$+CHR$(10
1270                                     )
1280                                     1320 UNTIL ptr=ASC"" OR ptr=ASC"@"
1290                                     g:
1300                                     1330 ptr=ptr+1
1310                                     1340 dummy$
1320                                     1350 ENDFPROC

```

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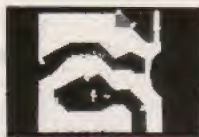
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**John Geraghty presents
a super-fast machine
code replace facility**

HOW often have you started to write a program, then halfway through decided that your choice of variable names wasn't as good as it could have been? Sometimes we start off using short, single letter variables, then as the program grows in complexity and becomes more difficult to read we wish we had used more meaningful ones.

Or perhaps long meaningful ones are used, then we find we are short of memory and the program will not run unless we shorten them.

It happens all too often, and at such times the only solution is to go through the program line by line and laboriously change each occurrence of the old variable name to the new one. The longer the program, of course, the more tedious and time-consuming the task.

However, help is at hand in the form of a very fast and powerful machine code utility called Replace. The program listed here assembles a short machine code routine into page &C00, which is normally reserved for character definitions, but as these won't be needed during the typing-in phase of a program, it should be free.

When the program is run the machine code is automatically saved to disc - don't forget to save the source code listing too, but under

Try ringing the changes

a different filename. You can type NEW to get rid of the program, and either start typing in at the keyboard or load any Basic program from disc or tape.

Before using Replace you must enable the routine by calling &C00, and this must also be done if you simply *LOAD the machine code too. To replace the variable *n*, say, with *number* you would type:

```
DEFn=number
```

Everything between the F and the equals sign is replaced by everything after the equals.

In general terms, to replace *oldname* with *newname* the syntax is:

```
DEFoldname=newname
```

The utility has some unexpected features. You can search for and replace Basic keywords. This means that you could replace every occurrence of PRINT with RETURN. This isn't much use, however, as it will make nonsense of your program, but is a point to be wary of.

To disable the replace facility enter END at the keyboard.

```
10 REM RESOURCE
20 REM By John Geraghty
30 REM (c) Electron User
40 MCODE
50 PROCassemble
60 PRINT "Press <RET> to save REPLA
CE"
70 REPEAT UNTIL GET=13
80 *SAVE REPLACE C00 D00
90 END
100 :
110 DEF PROCassemble
120 search=6100
130 replace=6140
140 string=670
150 slen=672
160 rlen=673
170 lineaddr=674
180 llen=676
190 temp=677
200 def tln=60D
210 and tln=62D
220 page=618
230 input=6700
240 wrch=620E
250 search=60E2D
260 insert_line=60CB
270 :
280 FOR pass=0 TO 2 STEP2
290 P=6C0D
300 OPT pass
310 LEX #main MDE100
320 LDY #main DIV6100
330 .change_vector
340 SET
```

```
350 STX wrchv
360 STY wrchw+1
370 CLI
380 RDS
390 :
400 .main
410 PHP
420 PHA
430 TGA
440 PHA
450 TYA
460 PHA
470 :
480 LDA input
490 CMP #end tln
500 BEQ restore_vector
510 CMP #def tln
520 BNE exit
530 :
540 LDX #search MD6100
550 STX input
560 STX stringv
570 STX lineaddr
580 LDA page
590 STA lineaddr+1
600 LDY #search DIV6100
610 STY stringv+1
620 LDA #ASC" " \string delimiter
630 JSR save_strings
640 BEQ exit
650 STY slen
660 :
670 LFR #replace MD6100
680 STA stringv
690 LDA #60D \string delimiter
```

```
700 JSR save_strings
710 BEQ exit
720 STY rlen
730 :
740 .check_a_line
750 LDY #1
760 LDA (lineaddr),Y
770 BMI exit \ie. if TOP
780 INY
790 INY
800 LDA (lineaddr),Y
810 .rcheck
820 STA llen
830 JSR instr
840 BEQ next_line
850 JSR exit
860 BEQ next_line
870 LDA temp
880 BNE rcheck \always
890 .next_line
900 LDY #3
910 LDA (lineaddr),Y
920 CLC
930 ADC lineaddr
940 STA lineaddr
950 BEC check_a_line
960 INC lineaddr+1
970 BNE check_a_line \always
980 :
990 .restore_vector
1000 LEX #62D
1010 LDY #6DE
1020 JSR change_vector
```

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```

1030 :
1040 .edit
1050 PLA
1060 TRX
1070 PLA
1080 TRX
1090 PLA
1100 PTP
1110 JMP search
1120 :
1130 .save strings
1140 STA temp
1150 IDY #0
1160 .sloop
1170 INX
1180 LDA input,X
1190 CMP temp
1200 BEQ ssewd
1210 CMP #60D
1220 BEQ sffail
1230 STA (strings),Y
1240 INY
1250 CPY #640
1260 BNE ssloop
1270 .sffail
1280 LDA #0
1290 RTS
1300 .ssewd
1310 TZA
1320 RTS
1330 :
1340 .instr
1350 LDY llen
1360 DEC llen

```

```

1370 LDX alen
1380 .lloop
1390 DEY
1400 DEY
1410 BMI ssewd
1420 CPY #3
1430 BEQ sffail
1440 LDA (lineaddr),Y
1450 CMP search,X
1460 BNE instr
1470 BEQ iloop
1480 :
1490 .edit
1500 INY
1510 STY temp
1520 IDY #0
1530 .head
1540 LDA (lineaddr),Y
1550 STA input,Y
1560 INY
1570 CPY temp
1580 BNE head
1590 :
1600 LDX #0
1610 .middle
1620 LDA replace,X
1630 STA input,Y
1640 INY
1650 BEQ sffail \if string is too
long
1660 INX
1670 CPX alen
1680 BNE middle
1690 :
1700 TZA
1710 TRX

```

```

1720 LDA temp
1730 CLC
1740 ADC alen
1750 TRX
1760 DEY
1770 DEY
1780 .tail
1790 INX
1800 BEQ sffail
1810 INY
1820 LDA (lineaddr),Y
1830 STA input,X
1840 CMP #60D
1850 BNE tail
1860 :
1870 \line no. into IntA...
1880 IDY #1
1890 LDA (lineaddr),Y
1900 STA a2b
1910 INY
1920 LDA (lineaddr),Y
1930 STA a2a
1940 :
1950 \set up string pointer...
1960 INY
1970 INY
1980 STY a37
1990 LDA #7
2000 STA a38
2010 JSR insert_line
2020 LDA #1
2030 .sffail
2040 RTS
2050 :
2060 ]:NEXT:ENDPROC

```

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Romarkably helpful?

MY micro is already pretty full of roms, but here is yet another from that respected supplier of quality Electron products, Pres. The latest addition to the range is Advanced File Manager (AFM) which is designed to take all the hard work out of managing your discs efficiently.

AFM comes on a bare rom chip which means you must have some means of plugging it into your Electron. The Plus 6 and Rombox Plus have suitable rom sockets built in, but Plus 1 owners will need a cartridge with a blank rom socket.

The other requirement is a monitor, as the software runs in 80 column Mode 0 and the text may be difficult or impossible to read on a colour television. I'm assuming, of course, that you've got either a DFS or ADFS disc system.

The rom can be called up with the command *AFM. The screen changes to Mode 0 and five windows are drawn as shown in the screen dump. It's worth noting that AFM remembers both the mode you were in and the colour palette when it was called up, and restores them when you exit.

Both ADFS and DFS users can alter the screen colours by pressing the minus sign for the foreground and equals for the background.

The rom has four main functions, Menu, Delete, Rename and Copy. The default is Menu and this function allows you to examine all the files on a disc and move back and forth through the directories. The files are displayed in the second window.

The options vary slightly depending on whether you are using the DFS or ADFS. ADFS users can enter a directory by moving the cursor to the directory name using the cursor keys and then pressing the Return key. You can move back up the directory structure by pressing ^, or return to the root directory with \$.

Running a program is a simple matter of moving the cursor to it in window two and pressing the Return key to signal your choice. Window four clears and a list of options pops up. You can choose from CHAIN, LOAD, *TYPE, *DUMP, *LIST, *RUN and *EXEC by using the cursor up and down keys and pressing Return.

Pressing the spacebar changes the currently selected window, so tapping this once enables you to move to window three and alter the operating mode with the cursor keys. The Delete facility allows you to tag files then delete them all in one go.

After setting Delete mode and tapping the spacebar until you get back to window two,

Do you find tidying up your discs tedious and time consuming? A rom designed to ease the problem is tried by Roland Waddilove

you can mark files by moving to them and pressing the Return or Delete keys. The filename is highlighted by inverting the colours. If you want to delete them all you just press Control+I. The Copy key is pressed to carry out the operation.

The advantage of this command is that files with widely differing filenames that can't be matched with a wildcard can be deleted in one operation. The disadvantage is that the procedure is cumbersome.

The Copy facility enables you to tag files, as with Delete, and after selecting the destination drive it then copies them. The operating mode is changed by tapping the spacebar until window three is active, then using the cursor keys to highlight Copy.

Pressing the spacebar clears window four and you are prompted to set the destination drive and directory. This done, you automatically move back to window two to tag the

files you want to copy. The cursor is moved with the cursor keys and Return selects them. When you have tagged all the files, pressing the Copy key starts the operation.

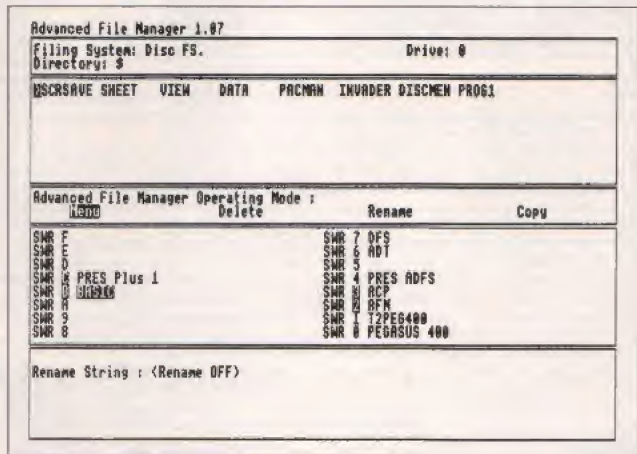
Several things can go wrong during this task and the two most common problems occur when the disc is full and when the destination disc contains a file with the same name. A disc full error brings up a menu which has options to abort the current file copy, stop the whole process, overwrite it, delete it or extend it so that the current file is tagged on to the end of the destination file. This is useful for merging two files.

If the destination disc contains a file of the same name you have the option to abort the current file copy, stop the whole process, overwrite it, delete it or extend it so that the current file is tagged on to the end of the destination file. This is useful for merging two files.

The Copy function is intelligent in that it makes use of any available spare ram. So if, for instance, you have sideways ram or ABR, this will be used to buffer the files so that more can be copied in one go.

The final function of AFM, Rename, is the most complex and difficult to get to grips with. To select it you tap the spacebar until the third window is active and use the cursor keys to highlight Rename. Then you go to the

Turn to Page 36 ▶



The Advanced File Manager's workscreen

◀ From Page 35

second window to highlight the file to be renamed – the same way as with the other options – and finally go to window five to enter the new filename. The Copy key executes the operation.

The only problem is that in one tenth the time it takes to carry this out I could have typed in a rename command at the keyboard. However, that's not the end of Rename's options. It is possible to use wildcards and rename more than one file at once, though I haven't found a use for this.

You can select more than one file for renaming by moving to each one in window two and pressing Return. When you enter the rename string in window five Control+1 represents the first character of the existing filename, Control+2 represents the second, Control+3 the third and so on.

These characters will not be changed by the rename operation, but the rest of the name will be. So what this means is that, for instance, you could rename the files APROG, BPROG and CPROG to ATEXT, BTEXT and CTEXT by typing Control+0 followed by TEXT for the rename string.

I must say that I'm not fully convinced that Advanced File Manager is worth the asking price of £34.50. Some of the functions provided are quite useful, but I found many rather cumbersome and slow and I could type them



in at the keyboard in a fraction of the time it took to boot up the rom, set all the parameters and execute the command.

I also experienced problems due to some sort of clash with the existing roms in my micro which meant that AFM wouldn't work properly until they had been disabled.

If the price was reduced to around £10-15 then I would be more enthusiastic, but as it

stands it can't be compared to other superb Pres roms like ADT and ADI which are bristling with genuinely useful features.

Product: Advanced File Manager

Price: £34.50

Supplier: Pres, 6 Ava House, High Street, Chobham, Surrey GU24 8LZ.

Tel: 0276 72046

The problem of language acquisition

Title: *Computer Languages – a guide for the perplexed*

Price: £10

Supplier: Penguin, 27 Wrights Lane, London W8 5TZ.

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THERE is quite a plethora of programming languages available for the Electron and its big brother the BBC Micro – Basic, Pascal, Forth, Logo – and it seems that new ones crop up almost every week. After experimenting with Basic, many aspiring programmers look around for something a little better. But with such a wide choice available, which language is best?

This is the dilemma facing many people that this book attempts to dispel. By educating the reader and expanding his knowledge of what is available it enables him to make a much better and wiser choice of software.

After all, a great deal of time and effort must be put into learning a new language, so the task is not to be taken lightly.

The author starts with a discussion of computer languages in general, and examines whether or not they are in fact true languages like English and French. She then moves on to chronicle the growth of computer languages.

Finally, in the first section, she compares the structure of languages and the various methods of classifying them, and looks at the ways in which they handle data.

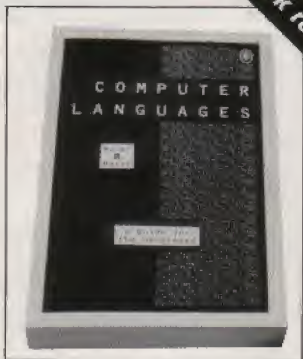
The major portion of the book deals with a description of 22 different languages. This isn't intended to be a programming tutorial, though there are one or two brief listings. These are used merely to illustrate a particular aspect of the language being discussed.

A fair proportion of the text is devoted to the history of each language, as once you know by whom, for what reason, and where a particular language was developed it becomes much easier to understand why it is so popular – or not so popular – and why it is used for solving a particular type of programming problem.

Did you know for instance, that Ada was named after Augusta Ada Byron, Countess of Lovelace, and inventor of the stored program? And that it was specifically designed for controlling military hardware?

It is often said that the camel is a horse designed by a committee. Well, Ada is the ultimate computer language, and was designed by the biggest committee of all – the US military – which explains a lot, if you've ever met the language.

APL – A Programming Language would you



believe? – must rate as one of the strangest languages around. It is often called a write only language as once you've written a program, you have no chance of reading and understanding it the next day!

There are many more examples I could quote, but that would spoil your enjoyment of the book. If you have an interest in computer languages, or if you simply want to know why structured Pascal programmers sneer at Basic hacks with their spaghetti-like code, then I can recommend this as a good read.

It won't teach you programming, but it will give you the knowledge and understanding to make a better choice of language to learn.

Roland Weddlove

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Each program is played on its own and the child does not need to master the words in the first program before tackling the next.

All objects illustrated are very familiar to children and frequently occur in other reading schemes

Cheshire Cat FUN WORDS includes:-

- Learn Word — sight vocabulary.
- Word Game — an exciting test of the words presented so far.
- Big/Little — an extension of sight vocabulary.
- Big/Little Game — an easy review and test on the previous concept.
- Lots of — introducing plurals

Fun Sums (Maths Level 1) Age 4-6 yrs.

Sixteen flexible exercise programs of games for up to four children are contained on twin cassettes or disk programmed for the home computer.

Each child's name is entered at the start and a complete record of results kept. All games can be set at two ability levels with any number of games for each exercise.

Right answers to a problem bring a Cheshire Cat grinning from the screen, a correct tick and a happy tune. Wrong answer and the program gives the unsuccessful child extra help.

Includes:-

- Counting: Keep count of Kicker Kangaroo's goal scoring
 - Number Recognition: Sell the required number of boats into harbour. Put the right coloured shapes into sets.
 - Sorting: An easy introduction to sums and to those + and = symbols—coloured beads give a visual aid.
 - Addition: A fun hello to the important concept of sequences.
 - Patterns: Spot the highest flower an exercise in visual perception.
- and much, much more...

Adder Sums Age 7-8 yrs.

A sixteen flexible exercise program of games for up to four children are contained on twin cassette or disk programmed for your home computer.

Each child's name is entered at the start and a complete record of results kept. All ADDER SUMS games can be set at one of two ability levels with up to any number of tries per child in each.

Right answers bring a Cheshire Cat grinning from the screen, who quickly steps in to help the child in difficulty.

Cheshire Cat ADDER SUMS includes:-

- Multiplication: Calculate the cost of items shown in the grocer's shop window.
- Addition: Correctly total the shopping bill from the grocers
- Division: Share out the biscuits using the simple technique provided.
- Time: Learn to tell the time of day, days of the week and the months of the year.
- Tables: Make a start or improve on those important times tables.

Sum Takeaway (Maths Level 2) Age 6-7 yrs.

Nineteen flexible exercise programs of games for up to four children are contained on twin cassettes or disk programmed for your home computer.

Each child's name is entered at the start and a complete record of results kept. All games can be set at two ability levels with up to 100 games for each exercise.

Right answers bring a Cheshire Cat grinning from the screen, a correct tick and a happy tune. Wrong answer and the program gives the unsuccessful child extra help.

Cheshire Cat Sum-Takeaway includes:

- Addition: Full hello to sums.
- Subtraction: Starts with differences and introduces Take Away.
- Charts: Ways of recording information. A vital concept in the child's future.
- Tens & Units: Delightful visual hello to numbers over nine.
- Multiply: First step in those times tables and the 'X' sign.

Sum Measure Age 9-13 yrs.

Six programs with a choice of 5, 10 or 20 questions are contained on twin cassettes or disk programmed for your home computer.

Two chances are given to achieve the correct answer, but don't worry extra help is provided for a child in difficulty.

At the end of each run the results are displayed thereby facilitating the monitoring of the child's progress

Cheshire Cat SUM MEASURE includes:-

- Length: Work out the length of a line in centimetres or millimetres.
- Area: Find the area of a rectangle using cm^2 .
- Volume: Give the volume of a cuboid in cm^3 .
- Temperature: Work out the temperature shown on the thermometer.
- Mass: Read the correct balance scale
- Capacity: Measure the amount of liquid in the cylinder.

Sum Times (Maths Level 4) Age 8-9 yrs.

Nineteen flexible exercise programs of games for up to four children are contained on twin cassettes or disk programmed for your home computer. Each child's name is entered at the start and a complete record of results kept. All games can be set at two ability levels with up to 100 games for each exercise.

Right answers bring a Cheshire Cat grinning from the screen, a correct tick and a happy tune. Wrong answer and the program gives the unsuccessful child extra help.

Cheshire Cat Sum Times includes:

- Tally & Bar Charts: An easy introduction to graphs.
 - Time: A moving clock for digital time.
 - Tens & Units: Addition & Subtraction of numbers over nine.
 - Symmetry: Lines of symmetry.
 - Co-ordinates: Important for reading maps and graphs.
 - Square Units: Invaluable for calculating areas etc.
- and much, much more...

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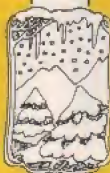
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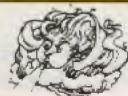
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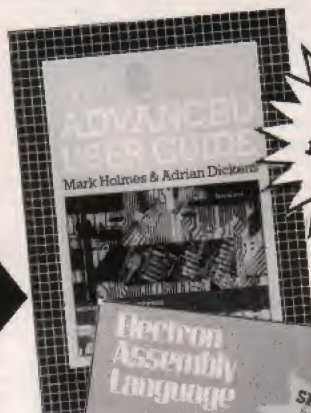
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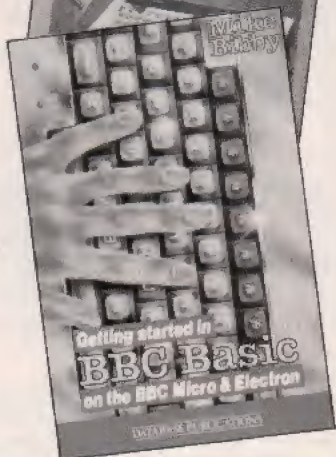
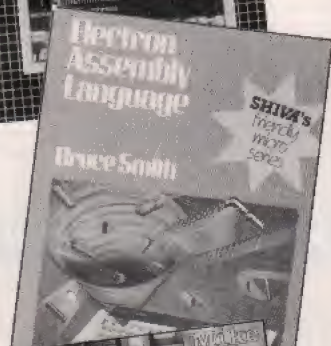
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Have you got what it takes to be a bomb disposal expert? Find out in this arcade game by Steve Bissell

YOU find yourself somewhere in war-torn Britain during the civil uprising of the late 1990s. Unexploded bombs have been left behind by fleeing Government troops and it is your job, as newly appointed explosives expert to the local freedom fighters, to locate and defuse the dangerous devices.

During your briefing you are told that the bombs may have been electronically linked in a desperate attempt to destroy Underground Headquarters. Once activated, you have only seconds to reach and disarm each bomb in turn.

Your task has been made harder by the discovery of a few partially hidden mines. It would seem that once defused, a bomb not only activates the fuse of the next bomb, but automatically primes a further mine.

Nobody knows to what extent the complex has been mined or how many bombs have been left. All surrounding buildings have been evacuated, and you are on your own.

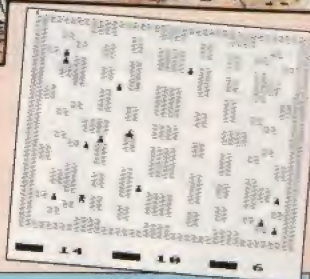
The first bomb will be activated the second you enter the cellar. Your success is vital to the survival of the entire local resistance movement.

EXPLOSIVE ACTION



You score a point for every second you survive, plus a hefty bonus when you disarm a bomb by running over it. Avoid the flashing mines – they are deadly to the touch.

After typing in and running the program one or two strange characters will appear. Don't worry, this is due to some of the character set having been redefined. To return the characters to normal, press Control+Break then type OLD and press Return.



```

10 REM Unexploded Bomb
20 REM by Steve Bissell
30 REM (c) Electronic User
40 MODEL:VDU 25,1,0;0;0;0;0;RESTORE
60:FOR I=1 TO 5:READ N,K1,N2,N3,N4,N5
:FX16
50 COL0 R,N4:MOVE N,N1:DRAW N2,M1:D
RAW N2,N3:DRAW N,N5:DRAW N,N1:SOUND 1,
-15,N5,2:NEXT
60 DATA 4,4,1275,1019,3,20,14,14,12
65,1000,1,40,22,22,1257,1001,2,40,300,
822,904,956,1,40,302,236,904,500,2,100
70 COL0 R,130:COL0UR 1:PRINTAB(10,
3)STRINGS(18,"TAB(10,4) UNEXPLODED
BOMB TAB(10,5)STRINGS(18,"
80 COL0UR 128:COL0UR 3:PRINTTAB(1,9
) Defuse the Bombs before they EXPLOD
E TAB(2,12)Beware of the partially hi
dden MINES
90 COL0UR 2:PRINTAB(11,17)? = M
ove LEFTTAB(11,19)?X = Move RIGHT
AB(11,21)?X = Move UPTAB(11,23)?Y
= Move DOWN
100 COL0UR 1:PRINTAB(9,28)PRESS A
KEY TO START:REPEAT:UNTIL GET:PRINTCH
RS(7)
110 MODE 5:DIM AS(13),SX(19,27):HI=
18

```

CONTROLS
Z Move Left
X Move Right
* Move Up
? Move Down

```

120 VDU 25,1,0;0;0;0;19,2,8;0;19,3,3
;0;
130 VDU 23,35,8,28,16,16,56,124,124,
56,23,35,0,56,16,16,56,56,56,23,33,
56,56,16,124,16,56,40,40,23,42,238,0,1
19,0,238,0,119,0

```

```

140 RESTORE 300:FOR IX=0 TO 13:READ
AS(IX):NEXT
150 COL0UR 1:FOR I0=0 TO 13:PRINT TA
B(0,1)AS(IX)TAB(0,27-IX)AS(IX):FOR JY
=1 TO 20:BS=MID$(AS(IX),JY,1):SX(JY-1,
10)=ASC BS:SC(JY-1,27-IX)=ASC BS:NEXT:
NEXT
160 REPEAT:SC=0:CL=110:BX=0:MY=0:MF
X=0:FX9,50

```

VARIABLES

DIM S%(19,27)	Copy of screen
DIM AS(13)	The maze
X%,Y%	Your coordinates
BX%,BY%	Bomb coordinates
MX%,MY%	Mine coordinates
HI%	High score
SC%	Your score

```

170 PRINTAB(0,28)STRINGS(60,"");*
FX10,5
180 COL0UR 131:COL0UR 1:PRINTAB(0,3
0)SCTAB(7,30)MI TAB(14,30)T1:COLO
UR 128
190 REPEAT:IX=RND(17)+1:Y=RND(25)+1
:UNTIL SX(IX,XY)=32:SY(XY,XY)=33
200 REPEAT:CX=CX-1:CY=CX-1
210 IF CX=0 COL0UR 3:REPEAT:BX=RND(
17)+1:BY=RND(25)+1:UNTIL SX(BX,BY)=
32:PRINTAB(CX,BY)M:SX(BX,XY)=35
:BX-1
220 IF MX=0 COL0UR 2:FOR IX=1 TO MEX
:REPEAT:MX=RND(17)+1:MY=RND(25)+1:UN
TIL SX(MX,MY)=32:PRINTAB(MX,MY)M
:SX(MX,XY)=30:NEXT:MX=1:MY=1
230 SX(XY,XY)=33:PRINTAB(CX,XY)M
240 REPEAT:IX=(INKEY-98 AND XX-10)
NKEY-67 AND XX-18):Y=(INKEY-73 AND YX
-1)-(INKEY-105 AND YX-26):UNTIL SX(IX,
HX,YX)YI<42
250 IX=IX+HX:YX=YX+HY:IF HX OR YX 30

```

```

UND 1,-15,5,1
260 COL0UR 3:PRINTAB(CX,XY)M:FXZ
1
270 IF SX(CX,XY)=35 SX(CX,XY)=32:FOR
LX=100 TO 500 STEP 25: SOUND 2,-15,LX,
1:NEXT:SC=CX+CY-1:0=0:MX=0:CL=100:0
N=INKEY(50)
280 COL0UR 3:PRINTTAB(3,30):SC0DU10
TAB(10,30):MIXTAB(17,30):C0DU10";
:IF CX=0:10=0: SOUND 1,-15,150,3
290 UNTIL C0DU10<1 OR SX(IX,IX)=38
300 IF SX(IX,IX)=38 COL0UR 129:COL0UR
R 2:PRINTTAB(0,28) STEPPED ON A MINE
: ELSE COL0UR 129:COL0UR 2:PRINTTAB(
0,28) BOMB HAS EXPLODED ;
310 IF SC0DU10=MIH MIH=SC0DU10
320 COL0UR 128:VDU 19,0,9,0;0;FOR L
X=200 TO 0 STEP -5:SOUND 0,-15,LX,1:NE
XT:VDU 19,0,0;0;0;FX9,20
330 FOR IX=0 TO 19:FOR JX=0 TO 27
340 IF SX(IX,JX)>42 SX(LX,JX)=32:PR
INTTAB(IX,JX)
350 NEXT:NEXT:DX=INKEY(100):FX10,40
360 COL0UR 2:PRINTTAB(0,28)PRESS A
KEY TO START:FOR LX=200 TO 100 STEP -
10:SOUND 3,-15,LX,1:NEXT:FX21
370 KS=GETS:UNTIL KS=N:CLS:END
380 DATA*****
390 DATA* ** ** ** *
400 DATA* * * * *
410 DATA* * * * *
420 DATA* * * * *
430 DATA* * * * *
440 DATA* * * * *
450 DATA* * * * *
460 DATA* * * * *
470 DATA* * * * *
480 DATA* * * * *
490 DATA* * * * *
500 DATA* * * * *
510 DATA* * * * *
520 DATA***** ** ** ** *

```


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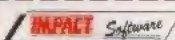
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THE year is 1,000,000 BC and dinosaurs are the rulers of the Earth. Srog, an intrepid caveman adventurer, is a little short on cash to finance his latest adventure so he sets out to find a fabled buried treasure chest containing untold riches.

No one knows its precise location, but it is said to lie many leagues to the east. Several adventurers have tried to discover its location before, but all have perished in the quest. Can you succeed in this perilous mission?

You control Srog and guide him across a sideways scrolling landscape in search of the chest. There are several hazards to watch out for, including great pits and flying boulders. Fortunately, you are quite athletic and can leap great distances, so these obstacles shouldn't be too much of a problem.

Srog is a multi-screen game and bonus points are awarded for completing each level. The keys are Z and X to move left and right,

Jaunt right back to 1,000,000 years BC and help Srog find buried treasure in this tricky game by Graham Barlow

and Return to jump. As you progress through the screens they become more difficult - you'll have to contend with multiple pits and several flying boulders at once.

Don't type in the space after the line number when entering the program. Watch out for the tick character - on the 7 key - as two together can look like a quote. Also some variables start with a capital letter D and could be confused with zero at a cursory glance.

Caveman capers



```

10 REM Srog
20 REM By Graham Barlow
30 REM (c) Electron User
40 ON ERROR MODE6:PRINT:REPORT:PRINT
  " at Line ";ERR:END
50 MODE6:PROC:INLET:MODE5
70 VDU23,224,60,61,63,6F,61F,63F,67
F,6FF
80 VDU23,225,680,6C0,6D0,6F0,6F0,6F
B,6FC,6FF
90 VDU23,226,60,60,60,60,60,638,67C
,6FF
100 VDU23,227,6AA,6FF,6FF,6FF,6FF,6F
F,6FF,6FF
110 VDU23,228,60,6C0,6E0,6E0,6F0,6F8
,6FF,6FF
120 VDU23,229,60,63,67,67,6F,61F,6FF
,6FF
130 VDU23,230,6FF,6FF,6FF,6FF,6FF,6F
F,6FF,6FF
140 VDU23,231,60,60,61,63,66,6E,61E,
61E
150 VDU23,232,60,6F0,6F8,6F,661,64F,
610,620
160 VDU23,233,611,621,647,649,651,65
E,650,668
170 VDU23,234,640,620,610,610,618,61
4,614,61C
180 VDU23,235,64,67,618,633,624,624,
612,61E
190 VDU23,236,620,620,6A0,6A0,6A0,6B
8,6B8,6F8
200 VDU23,237,64,67,6B,6B,612,614,62
3,63F
210 VDU23,238,620,620,620,6A0,690,64
B,624,63E
220 VDU23,239,60,63C,67E,6FF,6FE,67E
,63C,60
230 VDU23,240,60,60,61,66,68,63C,643
,641
240 VDU23,241,60,6F8,64,64,62,66,6A,
63E
250 VDU23,242,6FF,681,681,681,681,68
1,6FF,60
260 VDU23,243,6C2,682,684,688,690,6A
0,6C0,60
270 VDU23,244,61,67,6C,63D,6FC,63F,6
C,67

```

CONTROLS
 Z Left
 X Right
 Return Jump

VARIABLES
 X,Y Position of the mountains
 OX,OY Position of the ground
 Q%,P% Srog's position
 SC% Score
 HI% High score
 NAMES Name of highest scorer

PROCEDURES
 start Draws the screen
 inst Prints the instructions
 dead Kills you off
 screen Changes colours and windows


```

260 VXD23,245,4FF,4FF,444,4D5,444,45
D,45D,4FF
290 VXD23,246,4FF,4FF,473,46D,4ED,46
D,463,4FF
300 VXD23,247,4FE,4FF,41D,47D,445,46
F,4D,4FE
310 ENVELOPE 1,1,9,8,7,-3,-2,-1,126,
0,0,-126,126,126
320 VXD23,1,0,0,0,0:
330 AS=CHR$224+CHR$225+CHR$224+CHR$2
Z5+CHR$226+CHR$226+CHR$224+CHR$225+CHR
$226+CHR$224+CHR$225+CHR$226+CHR$226+C
HR$224+CHR$225+CHR$226+CHR$224+CHR$225
+CHR$226+CHR$226
340 C$=STRINGS(6,CHR$227)+CHR$228+CR
R$229+STRINGS(8,CHR$227)+CHR$228+CHR$2
29+CHR$227+CHR$227
350 B$=STRINGS(7,CHR$227)+CHR$228+CR
R$229+STRINGS(7,CHR$227)+CHR$228+CHR$2
29+CHR$228+CHR$229
360 C$=STRINGS(9,CHR$227)+STRINGS(3,
CHR$228+CHR$229)+STRINGS(5,CHR$227)
370 I$=STRINGS(20,CHR$227)
380 X$=I$*5
390 C#0=C#*28
400 C#1=P#*25
410 C1#1=P1#*25:T#1
420 C1#2=C2#*236:P#1=1:count#0
430 B#1=19:B#2=27:C#1#19:C#2#27
440 Q#1=11:Q#2=27:C#1#11:Q#2#27
450 C#1#18:C#2#26:C#3#18:C#4#26
460 L1#3:S#1=0:H1#100:H2#100
470 LEV#0
480 NAME$="GRAHAM"
490 PROCscreen
500 B$=A$*A$
510 D$=C$*C$
520 F$=E$*E$
530 B$=F$*F$
540 D$=I$*I$
550 PROCcheat
560 COLOUR1
570 PROCstart
580 REPEAT
590 FOR B#1=1 TO LEN A$
600 COLOUR31:COLOUR:PRINTAB(0,5)
0",L1$,TAB(5,5)0":LEV$:TAB(15,2):S#1
TAB(15,5):H1$
610 S#1=S#1+1
620 IF S#1=H1 H1=S#1
630 COLOUR1
640 PRINTAB(X,Y):MID$(B$,S#,LEN A$)
650 COLOUR130:COLOUR1
660 IF T#1 PRINTAB(CX,CY)MID$(D$,S
%,LEN C$)

```

```

670 IF T#2 PRINTAB(CX,CY)MID$(F$,S
%,LEN E$)
680 IF T#3 PRINTAB(CX,CY)MID$(H$,S
%,LEN G$)
690 IF T#4 PRINTAB(CX,CY)MID$(J$,S
%,LEN I$)
700 IF T#5 OR T#6 PRINTAB(CX,CY)M
ID$(K$,S#,LEN I$)
710 IF M#1=1 COLOUR2:VDU31,C1#,P1#,2
31,232,8,8,10,233,234,8,8,10,C1#,C2#
M#0
720 IF T#4 OR T#5=COLOUR2:VDU31,CX#,
CY#,Z39
730 IF T#5 COLOUR2:VDU31,CQ#,CQ#,
Z39
740 IF T#6 COLOUR2:VDU31,CO#,CO#,
240,241,8,8,10,242,243
750 COLOUR:VDU31,CA#,PA#,231,232,8,8,
10,233,234,8,8,10,C1#,C2#
760 IF T#4 OR T#5 VDU31,BA#,BY#,23
9
770 IF T#5 VDU31,CX#,CY#,239
780 IF T#6 VDU31,CA#,CY#,240,241,8,
8,10,242,243
790 IF P#26 PROCcheat
800 C#1#1=P1#*P#
810 C#2#18:C#3#18:C#4#18
820 CQ#1#18:CQ#2#18:CQ#3#18
830 CQ#4#18:CQ#5#18:CQ#6#18
840 IF T#4 AND B#1=0 B#1=19
850 IF T#5 AND B#1=0 B#1=19
860 IF T#6 AND Q#1=0 Q#1=19
870 IF T#4 OR T#5 B#1=B#1+1
880 IF T#6 Q#1=Q#1+1
890 IF T#6 C#1=C#1+1
900 IF C1#1=235 C1#1=237:GOTO920
910 IF C1#1=237 C1#1=235
920 IF C2#1=236 C2#1=238:GOTO940
930 IF C2#1=238 C2#1=236
940 IF T#6 AND C#1#18 PROCcheat1
950 IF T#5=4 AND B#1#18 AND BY#1#18+2
OR T#6=4 AND B#1#18 AND BY#1#18+2
PROCcheat
960 IF T#5 AND Q#1#18 AND Q#1#18+2
PROCcheat
970 IF T#6 AND Q#1#18+1 AND Q#1#18+
2 PROCcheat
980 *FXZ1
990 IF INKEY=74 AND POINT(C#*64,927-
P#*32)=1 P#*64-S#*18=1:SOUND,1,52,4
1000 IF POINT(C#*64,927-P#*32)=2 P#*6
4+1:R#1=1
1010 IF INKEY=96 AND O#1=0 O#1=1:R#1=
-1

```

```

1020 IF INKEY=67 AND O#1=0 O#1=1:R#1=
-1
1030 count=count+1:IFcount=100 PROChe
at1
1040 NEXT S#
1050 UNTIL FALSE
1060 DEF PROCcheat1
1070 PROCcheat
1080 T#1=1
1090 IF T#7 PROCcongrat:T#1=1
1100 S#1=1
1110 PROCcount:O#1:P#1=25
1120 PROCcheat
1130 COLOUR1
1140 count#0
1150 PROCstart:ENDPROC
1160 DEFPROCscreen
1170 VDU19,3,4,0:
1180 VDU28,0,29,19,16:COLOUR130:C1$:V
DU28,0,15,19,0:COLOUR131:C1$
1190 VDU26:COLOUR:FOR A#0 TO 19:VDU3
1,A,29,230:NEXT
1200 ENPROC
1210 DEFPROCcheat
1220 B#1=19:B#2=27:C#1#19:C#2#27:Q#
1#11:Q#2#27:C#1#11:Q#2#27
1230 C#1#18:P#1=25:C1#1:P1#25
1240 COLOUR31:PRINTAB(X,Y):A$
1250 COLOUR130
1260 IF T#1PRINTAB(CX,CY):C$:PROCcu
rat
1270 IF T#2PRINTAB(CX,CY):E$
1280 IF T#3PRINTAB(CX,CY):G$
1290 IF T#4PRINTAB(CX,CY):I$
1300 IF T#5PRINTAB(CX,CY):J$
1310 IF T#6PRINTAB(CX,CY):K$
1320 FORZ=1TO3
1330 SOUND,-15,100,3
1340 COLOUR:VDU31,CA#,PA#,231,232,8,8,
10,233,234,8,8,10,C1#,C2#
1350 FORA=1TO500:NEXT
1360 COLOUR2:VDU31,C1#,P1#,231,232,8,
8,10,233,234,8,8,10,C1#,C2#
1370 FORB=1TO500:NEXT
1380 NEXTZ
1390 ENDPROC
1400 DEF PROCcongrat
1410 COLOUR28:C1$:COLOUR1
1420 PRINT"" Well done!":COLOUR
2:PRINT""You found the chest!":
1430 COLOUR3:PRINT"" Press space fo
r"" another go."
1440 *FXZ1
1450 LEV#LEV#+1
1460 REPEAT:PROCcount:UNTILINKEY=99
1470 ENPROC
1480 REM Tune1
1490 DATA 108,96,108,96,100,88,100,88
,96,80,88,108,96,80
1500 DATA-1
1510 DEFPROCtune1
1520 RESTORE1490
1530 REPEAT
1540 IFpitch=-1 ENDFPC
1550 SOUND,-15,pitch,2
1560 FORZ=1TO130:NEXT
1570 GOTO1530
1580 REM Tune2
1590 DATA 52,60,68,60,52
1600 DATA -1
1610 DEFPROCtune2
1620 RESTORE1590
1630 REPEAT
1640 IFpitch=-1 ENDFPC
1650 SOUND,-15,pitch,2
1660 FORZ=1TO130:NEXT
1670 GOTO1630
1680 DEFPROCcheat
1690 COLOUR130:COLOUR:VDU31,CA#,PA#,
244,245,246,247

```



SCORE 211
HIGH 211



1700 FOR=1TC600:NEXT
 1710 PROCtime2
 1720 FOR=1TOL500:NEXT
 1730 LI=LI-1
 1740 DELI=0 PROCspcrog
 1750 G=1
 1760 PROCcman:O=1:P=25
 1770 PROCwader:COLOUR1
 1780 PROCstart:ENDPROC
 1790 DEFPROCwader
 1800 COLOUR:VOI31,0,2,231,232,8,8,10
 ,233,234,8,8,10,235,236
 1810 VOI31,5,2,240,241,8,8,10,242,243
 1820 PRINTAB(9,2);"SCORE";TAB(9,5);"
 BIEE!"
 1830 ENDFPROC
 1840 DEFPROCboom
 1850 FOR=200 TO 255 STEP4:SOUDI1,-15
 ,A,1:NEXT
 1860 FOR=1TOL200:NEXT
 1870 COLOUR129:COLOUR2:CLS:PRINTTAB(3
 ,15);"Bonus ":"%:" X 100"
 1880 SC=SC+P*100
 1890 FOR=1TOL600:NEXT
 1900 ENDFPROC
 1910 DEFPROCspcrog
 1920 COLOUR128
 1930 CLS
 1940 COLOUR2
 1950 IF HI1> HI2 PROCsuperspcrog
 1960 HI2=HI1
 1970 FOR=OTOL9:PRINTAB(A,3);"":NEXT
 T
 1980 FOR=OTOL9:PRINTAB(A,29);"":NE
 XT
 1990 FOR=3TOL28:PRINTAB(O,A);"":NEXT
 T



2000 FOR=3TOL28:PRINTAB(19,A);"":NE
 XT
 2010 VOI28,1,28,18,4
 2020 FOR=1TOL44:COLOUR3:PRINT"SPROG!"
 ";:NEXT
 2030 COLOUR2
 2040 PRINTAB(6,1);"SPROG!"
 2050 PRINTAB(1,5);"By Graham Barlow"
 2060 PRINTAB(5,7);"(c) 1986"
 2070 PRINTAB(5,11);"Today's"
 2080 PRINTAB(2,13);"Super Sprogger"
 2090 PRINTAB(7,15);"is"
 2100 PRINTAB(5,17);NAME\$
 2110 PRINTAB(2,19);"who scored ":"HI2
 %
 2120 PRINT"" Press space"
 2130 *FX21
 2140 REPEATUNTILINKEY=99
 2150 CM=0:CM=28:O=1:P=25:CL=1:P1=5
 25:T=1
 2160 CL=235:C2=236:M=1:count=0

2170 BK=19:BY=27:CB=19:CB=27:CK
 =11:CK=27:CG=11:CG=27:CM=18:CM=
 26:CM=18:CM=26:LI=3:SC=0:LEV=0
 2180 VOI26
 2190 ENDFPROC
 2200 DEFPROCsuperspcrog
 2210 PROCtime1
 2220 COLOUR2
 2230 PRINT"" You are the new"
 2240 COLOUR1
 2250 PRINT"" Super Sprogger"
 2260 COLOUR3
 2270 PRINT"" Type in your name"
 2280 *FX21
 2290 INPUTAB(6,15);" NAME\$
 2300 IF LEN(NAME\$)>6:CLS:COLOUR2:PRIN
 TAB(4,15)"Too long!";TAB(0,19)"Max. 6
 characters.":VOI7:FOR=1TOL500:NEXTM:
 CLS:COLOUR:PRINT"" Try again.":GOTO2
 Z10
 2310 CLS:ENDPROC
 2320 DEF PROCInat
 2330 CLS
 2340 PRINT"" _____SPROG !-
 _____"
 2350 PRINT TAB(7,4);"By Graham Barlow
 (C) 1986"
 2360 PRINT""Sprog is looking for a ma
 gic treasure""chest to finance his fu
 ture adventures""You start off with 3
 Sprogs and must""avoid falling into
 holes or being hit""by rolling stones
 ."
 2370 PRINT""PENS :""- 2 - ru
 n left""- X - run right""- RET
 URN - jump"
 2380 PRINT""Press space to Sprog!":RE
 PEATUNTILINKEY=99
 2390 ENDFPROC

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MICRO MESSAGES

Going for the big one...

I HAVE finally made that great decision which becomes harder to make with the appearance of each issue of your excellent magazine - at last I'm going to buy a new computer.

I have great faith in Acorn computers and I could not live without BBC Basic, so I have decided to buy something from the Master series. I have noticed a lot of Master 128s being sold cheaply second hand. Does this mean there is a fault of some sort?

I want to buy a computer for which good quality software is available, but I have noticed that in most advertisements there isn't a section for the Master, but instead it states that the software is Master compatible. Does this mean I would just be buying the BBC Micro versions?

I haven't heard much about the Master Compact since it was released, but there does seem to be a lot of software specially made for it, so would I be better off buying this?

Finally, I recently bought a printer dump rom for my uncle's BBC Micro which I have on long term loan. After performing open heart surgery on my dream machine I got it to work and am now capable of printing

pieces of my own work. However, I would like to be able to print screens from commercial software.

The rom is activated by the command *OIMAGE. I know it is possible to program a key to call a routine from within a game, as your Snapshot utility does just that. - **Henry Coles, Keighley, West Yorkshire.**

● Both the Master and Master Compact are alive and thriving. There is nothing wrong with either. They are very similar and are supported by a large range of software. Most of the games are identical to the BBC Micro versions, but occasionally Master versions contain extra music or graphics.

It's a matter of personal preference which micro is best, but a point to bear in mind is that the Master has a built-in tape facility, but the Compact can't be used with a cassette system. This could be a serious limitation if you regularly use tapes or tape-based software.

You could try replacing the SAVE command in Snapshot with OIMAGE and see what happens. If you're lucky the screen will be dumped to the printer. Note that it won't work with all software.

A better boot for View

I HAVE a 64k Electron equipped with a double disc drive system and use Acornsoft's View word processor for all my correspondence. I have constructed a !Boot file for all my word processor discs that call up View which sets the machine to Mode 3, accesses shadow ram as a printer buffer, loads your excellent Printer Driver and programs the function keys to my requirements.

This serves me very well, but I would like to improve it even further, and as yet I have been unable to achieve the desired enhancements. I want to switch off Caps Lk and disable the Break key on startup - always a source of heartache.

Could you tell me what I have to put in my !Boot file to do this? - **J. Buckler, RAF, Laefbruch.**

● You need to use *FX202,x to set the Caps

Lk key. Bit three of x is set to one if Shift is pressed, bit four is zero if Caps Lk is on, bit five is zero if Shift lock is on, bit six is one if Control is pressed and bit seven is one if Shift is enabled. If a "lock" key is pressed Shift reverses the lock. The command you want is *FX202,16.

You can't totally disable the Break key, but you should find that it has no effect apart from taking you back to the command page. View automatically recalls your text from memory and no harm is done, so we can't see what your problem is here.

Outstanding service

MAY I, through your publication, offer this praise for Pres. I have recently taken to using my Electron on a much more intensive basis than before, and ordered the AP3 disc

drive package from Pres. Within a week it had arrived, and very good it is too.

I ordered a View rom cartridge in the period running up to Christmas, and it arrived within 10 days. I had problems using some of the utility programs on the Welcome disc supplied with the AP3.

Despite the possibility that I may have caused the corruption of the disc myself, without quibble Pres suggested I send the disc back with only a minimal charge to cover postage and so on. They even recovered the program I had created as an experiment.

A firm that takes such good care of its customers deserves to be publicly praised and encouraged. - **Martin Rowley, St. Albans, Hertfordshire.**

Giant leap forward

I BELIEVE that development of the Electron has taken a great step forward with the introduction of Slogger's new Remote Expansion. No longer need an Electron computer system be an ever-increasing jumble of electronic boxes joined by writhing snakes coming from the plug in points, but it can easily become an elegant and functional computer system similar to the classic IBM PC.

Not only does the concept of remotely packaging all additional parts tidy up the working area, but it also eliminates the dreadful prospect of disturbing the cartridge-based add-ons in the excitement just before becoming Elite.

However, even Slogger's new masterpiece is capable of a little further improvement. The Remote Expansion has its own mains on/off switch at the back which controls the mains power to the computer and disc drive. No doubt, most of us use our Electrons with conventional TV or monitor displays, often a printer and possibly a ca. sette recorder.

Within the unit there is provision for the signal lines to these units, but not for the mains power supplies. But don't despair. The mains wiring can easily be tidied up by fixing an extension cable connector onto the back of the Remote Expansion and wiring it into the mains switch provided by Slogger.

A suitable mains distribution board would seem to be that available from Maplin - part number RW68Y costing £6.95.

I have discussed the concept of the additional power distribution board on the

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back of the unit with Andrew Hilbig of Slogger and received his blessing. The switch provided is rated at 10A and there is space for the board to be screwed on to the back of the unit.

The mains connections will have to be soldered on to the switch, but similar wiring operations are necessary to incorporate the Electron and disc drive power supplies in to the Remote Expansion. — Peter Hills, Princes Risborough, Buckinghamshire.

Bigger windows

My setup is a Rombox Plus, Starstore, a Citizen 120D printer and an Electron which I have owned for six years. Please could you publish a screen dump for my printer, as I have made several attempts but failed miserably.

From your April 1988 issue I typed in the Squash program which allows 40 characters in Mode 5. When I try to create a text window it will only allow it to have 20 characters across, which is half the screen. Can it be expanded to allow more than this? — Steven Elkins, Brandlesholme, Bury.

Unfortunately the Electron still thinks the screen is 20 characters wide — the standard Mode 5 size. You can't really get round this, so it's best to forget about windows and simply print on the screen as usual.

We haven't used a Citizen 120D printer so we'll have to ask our talented readers to supply a screen dump.

Lost for a few words

I AM an Electron addict and compulsive reader of your magazine, not to mention attendant of the exhibitions.

With the help of both the magazine and exhibitions I have a Plus 1, Cumana interface and 3.5in drive. Also View and a Panasonic KX-P1081 printer. For the display I use a 14in Akai with teletext and RGB.

Today, after using all of these very happily for nearly a year, I have a serious problem when printing. The text is corrupted by leaving out letters and spaces at irregular intervals. Also the tabulation is unreliable. View works, however, when printing to the screen. The printer Power-on and On-line lights

All programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program they will

work as normal, and the platter turns OK. The plugs on the printer lead seem to be in order.

The only possible clue I can find is the plug to the Plus 1. This can work loose and needs pushing in each time before switching on. Usually, the printer lead is kept plugged in, but on one occasion it had been disconnected (while switched off). Is it likely that it could have moved while the printer and micro were switched on?

What can I do about this problem? I feel absolutely lost without my word processor. Handwriting is not my strong point. — P. Bissell, Southend-on-Sea, Essex.

Tracking down problems like this is easy if you have a friend with a similar set-up, then you can swap printers, cables and so on and see if it makes any difference.

From what you say, we would first suspect the plug on the printer lead that fits into your Plus 1. Strictly speaking you shouldn't plug in or unplug things when your micro is switched on. However, having said that, we've been plugging in switched on printers to our Electron for five years and haven't had any problems, so this is unlikely to be the cause.

The plug on the lead has probably worked loose and a replacement may be the simplest and cheapest solution. Try a friend's lead and check that this cures the fault first. If this doesn't help, try his printer, then Plus 1 until you find the faulty item.

Looking for a printer

I BOUGHT my first copy of Electron User today and I have to say I was very impressed. I've had my Electron for about three years now and I'm interested in buying a printer for it. Can you tell me which is best? — Angel Walters, Newark, Notts.

The Brother HR5 is popular with many readers as it is very cheap — it can often be found for less than £100. However it is a thermal transfer machine and though the quality is good enough for listings for your own use, for letters and documents you would be best served by something like the Panasonic KX-P1081 at £179. Its output is excellent and it offers a wide variety of print styles.

It never ceases to surprise us when we hear of Electron owners who have had their micro for several years, but have only just discovered Electron User. We're well into volume six, yet there are still many Electron owners who are missing out on this mine of information. Spread the word!

almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

Supporting role

I FEEL I must write in support of those correspondents who have asked you not to succumb to requests for more games, reviews, cheats and so on.

Being 70+ it probably takes me longer than a younger person to digest technical articles, but I have found them to be of immense value in helping me to understand and adapt for my own purposes the extremely useful utilities and other programs which you print.

My Electron is supported by a Plus 3, Rombox Plus, View cartridge and Panasonic KX-P1081 printer which I find excellent for word processing.

The View printer drivers you have published are very good, but I find the VPD program and supporting article in the September 1988 issue of your sister publication, The Micro User, to be more versatile.

I know there are sideways ram cartridges for the Electron, but where can I get it in chip form to fit into the rom sockets in my Rombox Plus?

Your Rainbow design utility (February 1988) has interested me lately, and I have used your screen dump (June 1986) to print the screen. My method may not be very elegant, but it works. Ideally, perhaps an extra box for PRINT or DUMP should be added to the existing SAVE and LOAD boxes, but by adding:

```
865 GC0L0,128:MOVE 1279,1023:MOVE 0,92
7:PLOTB3,0,1023:MOVE1279,927:MOVE0,927
:PLOT 83,1279,927868:MOVE0,0:MOVE1279,0
:PLOT83,0,96:MOVE1279,96:MOVE0,0:PLOT8
3,0,96867CALL 690A
```

all the boxes will be cleared to the background colour after saving and the screen dump will be called.

I find that the EDump program suits my Panasonic printer for Modes 2 and 5, but a more refined pattern is provided by adapting it to Mode 1 as follows:

```
300 I2M#76:JSR oswrch
320 I2M#192:JSR oswrch
340 I2M#3:JSR oswrch
920 *SAVE B000E1,900 99T 90A
```

I sometimes use my grandson's Atari 520STFM for word processing, but the results are no better than that with my humble Electron. — E. Evans, Llanelli, Dyfed.

Key to the problem

IN chapter 24 the Electron manual tells you how to use the programmable function keys, but does not tell you the numbers to use. It gives them for Break and a couple of others, but not for the rest. Could you print them or tell me where I can find them?

Is Slogger's T2P3 a rom cartridge or a rom chip, because the advert does not state clearly? — Nick Smith, Arnold, Nottinghamshire.

● The function keys are printed in light brown on the front of the number keys, and the key number is the same as the number on the key. The only exceptions are the cursor, Copy and Break keys which can also double as function keys after a *FX4.3.

The Copy key is *KEY11, and the left, right, down and up cursor keys are *KEY12, *KEY13, *KEY14 and *KEY15 respectively.

T2P3 is a rom chip, not a cartridge.

Wiping out errors

*THERE was a mistake in the January 1989 issue of Electron User. Roland Waddilove's article Disc wipe out has a machine code *WIPE program, and line 660 reads EQU B 0, but this doesn't work. However, if you change it to EQU D 0 the program runs without any trouble at all. — A. Ross.*

● Our master copy reads EQU B 0 and this works fine, so we can't understand why yours shouldn't. It is possible that you have made a mistake elsewhere in the program and the EQU D 0 fixes it.

Consider a clean up

I AM an avid reader of Electron User and have had an Electron for four years. I enjoy programming and used to be able to save the routines, but for the past couple of months I have not been able to save and later retrieve them. I can't even save my own Repton screens from the screen designer.

I have tried the Cassette Verify program (10 Liners, November 1987), but to no avail. I have also tried removing the ear plug so that no interference is picked up by the mic plug, and saving and reloading without my Bud joystick interface fitted. — Merlin Fox, Canterbury, Kent.

● Try cleaning the read/write heads of your cassette recorder, then adjust the azimuth. The December 1988 issue of *Electron User* contains a feature explaining how to do this.

Speedy Basic solution

I HAVE a useful tip for people who want to speed up their Basic programs. Just type:

```
1:900=60586078
```

CALL 900 enables the speed-up effect and CALL 902 disables it. The code can be relocated to any spare four-byte position. This gives greater speed to the currently running program by turning off interrupts. This means that for effective use the code must be dis-

Business add-ons

I HAVE an Electron computer and have been using this with a TS.80 tape recorder to save programs. I now wish to use a disc drive, spreadsheet and database for business.

Could you tell me what extras I need to do this — Plus 1, disc drive type, roms and so on? — T. Gentry, Beverley, Humberside.

● There are many alternative set-ups, so you should shop around for the best prices. Both Slogger and Pres can supply a Plus 1 or Rombox Plus, disc interface and drive. Go for an E00 DFS, as the extra

memory available over an ADFS is useful in business applications.

Viewsheet on rom cartridge is the best spreadsheet, and Slogger's rom-based Starstore II is a good database.

Two essential business items you have missed off your list are a word processor and printer; the latter is also essential for use with the spreadsheet and database. Acornsoft's View, or Slogger's Starword — both are very similar — are good word processors, and Amstrad and Panasonic have a range of high quality, low price printers.

abled before the program tries to read the keyboard or access the TIME function and reenabled afterwards.

The speed increase given to some programs, notably Return to Moonbase Alpha, is quite impressive. — A. Taylor, Gillingham, Kent.

Controlling a robot

I AM examining the possibility of trying to use the user port of the Electron to control external applications such as a small robotic arm. Could you please tell me the hex address in the Electron's memory of the user port?

Do I require the Plus 1 or other add-ons so I can access the 0V ground, 5V input and output pins, as I have not been able to find this information in the user guide or your Memory Map article?

I am considering learning another programming language such as Pascal, Fortran or Cobol, but most important, Pascal. Is there any way of making it possible for the Electron to be programmed in Pascal or another language, via perhaps, a Plus 1 cartridge or rom chip?

Finally, how can a mouse be added to the Electron? Do I need an RS423 interface and is there a special memory address for this? — Thomas How, Berkhamsted, Hertfordshire.

● Adding a robot arm and controlling external hardware is quite a complicated process and you'll first need a Plus 1 and user port. The Electron has not got a user port built in — so it couldn't feature in the Memory Map article — but Slogger and Pres should be able to supply these items.

Don't be tempted to plug things straight into the back of the micro, as it is quite easily damaged. If you are fairly competent with a soldering iron you could build your own user port by following Joe Pritchard's Hardware Projects series in the August 1988 to March 1989 issues of *Electron User*.

The only programming language available

on your list is Pascal. Acornsoft produced two versions, one on rom cartridge and the other on tape. However, they may be quite difficult to find, as they are in short supply.

Lisp and Logo, two alternative languages, are more readily available on rom cartridge and are worth considering if you can't get hold of Pascal.

You don't need an RS423 for a mouse, and there isn't a memory address associated with it. Pres or Slogger should be able to supply you with the correct hardware and software.

Teletext Electron

DID you know that it is possible to have the full 64 character teletext graphics on an Electron? Executing the following short piece of code defines an array T\$ in such a way that the statement:

```
PRINT T$(n)
```

where n is between 0 and 63 will print the required character:

```
10 REM Teletext graphic characters
20 MODE63
30 DIM T$(63)
40 FOR N=0 TO 31
50 VDU 23,N#+160
60 FOR I=0 TO 4 STEP 2
70 R#=(LA DIV 5+2 : VDU -56*(N AND 2*R#)<0)-7*(N AND 2*(R#+1))<0)
80 NEXT I
90 T$(N)=CHR$(N#+160)
100 PRINTN#+160:T$(N#)
110 NEXT
```

The graphics are numbered in the standard order as in Mode 7 on the BBC Micro. — T. Lascelles, Portsmouth.

● This clever program is based on the fact that the teletext graphic character shapes are based on a simple mathematical formula. So it is possible to simply calculate the VDU codes with a little arithmetic rather than store dozens of lines of VDU statements.

ACTION

Emulate Keates - turn out verse after verse with Julie Boswell's composition generator

It has often been said that if you sit a monkey at a typewriter and allow it to hit the keys randomly eventually it will come up with the complete works of Shakespeare.

It might take a long time, but as Shakespeare's works are merely strings of characters the monkey may eventually hit on that random combination - it's just as likely as any other random choice of characters.

Alternatively, if you typed into your micro all the words in the dictionary and then got it to repeatedly print them out in a random order it would eventually produce a piece of text to rival the Poet Laureate's best efforts. For to a computer, a poem, is simply a collection of random words found in a dictionary.

However, two immediate problems prevent us from producing beautiful prose on our micros. The first is that we can't fit all the words in the dictionary into our Electron's 32k memory. The second is that it may take hundreds of years to come up with the right combination of words.

Is there a solution? Yes. What we can do is provide the Electron with a much shorter list of words and give it a form of artificial intelligence so that it can link them in sen-

Poetic injustice

tences. The result isn't perfect, but it is surprisingly good.

The program listed here, called Poetry, generates a never ending supply of original prose. It may not be up to Poet Laureate standard, but you'll be amazed at what it can do with such a small database of words.

Poetry uses the following "formula" to write the poem:

```
TITLE : Adjective + noun
LINE 1: Adjective + noun(plural) +
        adverb + verb(plural) +
        adjective + noun(plural)
LINE 2: Adjective + noun(plural) +
        verb(plural) + adverb +
        adjective + noun(plural)
LINE 3: Article + noun + verb +
        preposition + article +
        adjective + noun
LINE 4: Noun(plural) + verb(plural) +
        conjunction + article + noun
```

It has short lists of adjectives, verbs, nouns and so on that it can call up. For the title it

selects an adjective at random from its list, and follows it with a random choice of noun. The first line is a random adjective, then a noun, adverb, verb and so on, each chosen at random from its list.

The panel shows the sort of output you can expect. Is it poetry or is it nonsense? I'll leave it to you to decide. Whatever your thoughts, it's both fascinating and highly entertaining to watch.

You may like to add to its repertoire of words to increase the variety of prose generated. Simply add as many words as you like to the data statements at the end of the listing. The number of words in each data statement is stored as the first item in the line so don't forget to alter this too.



```
10 REM Poetry
20 REM By Julie Boswell
30 REM (c) Electron User
40 MODE 1
50 VDU 19,1,6,0;
60 REPEAT
70 CLS
80 CLOUR 3
90 REM title
100 PRINT
110 PROCword(1)
120 PROCword(2)
130 PRINT
140 PRINT
150 PRINT

160 CLOUR 2
170 REM Line 1
180 PROCword(1)
190 PROCword(2):PRINT "a";
200 PROCword(3)
210 PROCword(4)
220 PROCword(1)
230 PROCword(2):PRINT "a"
240 PRINT
250 CLOUR 1
260 REM Line 2
270 PROCword(1)
280 PROCword(2):PRINT "a";
290 PROCword(4)

300 PROCword(3)
310 PROCword(1)
320 PROCword(2):PRINT "a"
330 PRINT
340 CLOUR 2
350 REM Line 3
360 PROCword(5)
370 PROCword(2)
380 PROCword(4):PRINT "a";
390 PROCword(6)
400 PROCword(5)
410 PROCword(1)
420 PROCword(2):PRINT
430 PRINT
440 CLOUR 1
450 REM Line 4
460 PROCword(2):PRINT "a";
470 PROCword(4)
480 PROCword(7)
490 PROCword(5)
500 PROCword(2):PRINT
510 PRINT
520 CLOUR 3
530 INPUT "Press RETURN...";a$
540 UNTIL FALSE
550 END
560 a
570 DEF PROCword(w)
580 PRINT " ";
590 IF w=1 THEN RESTORE 750
600 IF w=2 THEN RESTORE 780
610 IF w=3 THEN RESTORE 810
620 IF w=4 THEN RESTORE 840
630 IF w=5 THEN RESTORE 870
640 IF w=6 THEN RESTORE 900
650 IF w=7 THEN RESTORE 930
660 READ n
```

```
670 FOR i=1 TO END(n)
680 READ w$
690 NEXT
700 IF COUNT=1 THEN w$=CHR$(ASC(w$)-
32)+MID$(w$,2)
710 IF COUNT+LEN(w$)>38 PRINT
720 PRINT w$:
730 ENDPROC
740
750 REM Adjective
760 DATA 7,"misty","clear","fragrant",
"colourful","delicate","bright","slender"
770
780 REM Noun
790 DATA 8,"scent","perfume","daffod",
"tulip","flower","petal","rose","d",
"rose"
800
810 REM Adverb
820 DATA 6,"superbly","extremely","g",
"ently","randomly","thoughtlessly","s",
"thly"
830
840 REM Verb
850 DATA 7,"wave","blow","drift","fl",
"out","wander","steer","aim"
860
870 REM Article
880 DATA 2,"the","a"
890
900 REM Preposition
910 DATA 3,"to","from","within"
920
930 REM Conjunction
940 DATA 7,"against","before","after",
"towards","away from","above","below
```

Fragrant rose

Slender tulips randomly blow delicate perfumes
Slender perfumes aim gently colourful daffodils
A petal blows within the colourful dream
Dreams float after the daffodil

Fragrant daffodils randomly steer slender tulips
Colourful scents wave extremely clear daffodils
The dream steers to the bright perfume
Roses blow towards the flower

Misty scents smoothly aim slender perfumes
Colourful scents wave randomly colourful petals
A daffodil drifts from the delicate daffodil
Petals float after the perfume

Press RETURN...?

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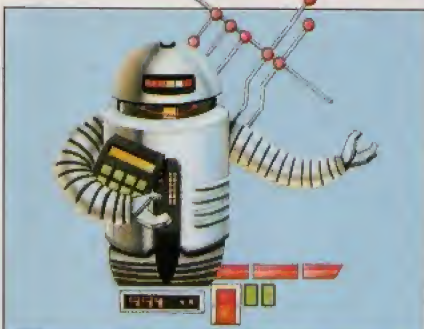


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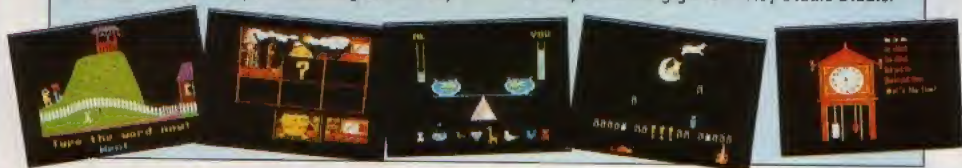
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